Performance of Ethical Equity Investing in the UK:

Active, Passive and Criteria

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Nitin Deshmukh

Middlesex University Business School

London

United Kingdom

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Abstract

Ethical equity investing account for roughly 22% of all assets under management in the UK – this puts it in a position where it can no longer be neglected. This thesis evaluates the performance of ethical equity investing in the UK. We look at three key issues: performance of ethical funds versus conventional funds; performance of ethical indices versus conventional indices; and finally, performance of certain ethical criterion versus other such criterion. Previous studies have looked at these issues but they have used a Mean-Variance (MV) and/or asset pricing model based methodologies; both these approaches suffer from serious drawbacks and hence we choose to employ a more robust Marginal Conditional Stochastic Dominance (MCSD) methodology. This is the first study in the area of ethical investing to use an MCSD approach to evaluate performance. In line with previous studies, we find that neither ethical nor conventional funds dominate each other. However, we find in contrast with previous studies that on average both ethical & conventional funds dominate the market; the said outperformance is resilient to the effect of fees. We also find in contrast with previous studies that the US & Global ethical indices are dominated by conventional ones. Thus in the US & Global context a passive ethical index investor has to pay a price for being ethical. In the UK & EU context, they pay no such price. We believe that the contrast in our findings with those of previous studies arises out of our use of a superior MCSD methodology as compared to the MV and/or model based methods used by them. And finally, we find that UK ethical funds which employ a comprehensive ethical strategy (i.e. subscribe to all ethical criteria) and/or invest locally (i.e. only in UK listed firms) outperform the market. Since the US & Global ethical indices also fare poorly, it appears that UK ethical investors would be better off investing in funds & indices with a local focus.

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List of Acronyms

ACC – Absolute Concentration Curves

ALC – Absolute Lorenz Curve

AUM – Assets Under Management

CAPM – Capital Asset Pricing Model

CSR – Corporate Social Responsibility

DEA – Data Envelopment Analysis

DJIA – Dow Jones Industrial Average

EIRIS – Ethical Investment Research Services

FTSE – Financial Times Stock Exchange

IMA – Investment Management Association

MCSD – Marginal Conditional Stochastic Dominance

MV – Mean Variance

NAV – Net Asset Value

NGO – Non-governmental Organisation

S & P – Standard and Poor's

SDI – Socially Directed Investment

SIF – Social Investment Forum

SRI – Socially Responsible Investment

SSD – Second Order Stochastic Dominance

TER – Total Expense Ratio

UK – United Kingdom

UKSIF – United Kingdom Social Investment Forum

USA/US – United States of America

Chapter 1 – Introduction

1.1 Preface

Ethical finance is an upcoming branch of finance. It is alternatively known as Socially Responsible Investment (SRI). The latter can apply to project finance, for example, government or non-governmental organisation (NGO) funding of environmentally friendly projects or extend to stock market investments in companies deemed to be ethical. The latter is more commonly known as ethical fund management and the funds thus managed are known as Ethical Funds. This study focuses on ethical investing with respect to the equity markets, specifically speaking, UK based ethical funds.

Ethical fund management has a long history but it has grown to prominence in the past decade or so. In the beginning, ethical fund management was treated as a fad by the wider finance community; a fad they thought would either pass off soon or be limited to the fringes. As things stand now, according to the Social Investment Forum website (2009), ethical funds account for $2.71 trillion out of the $25.1 trillion total assets under management in the US. Thus roughly eleven per cent of all assets under management with mutual funds in the US are ethically managed. According to the UKSIF (2007), the assets under management of ethical funds in the UK totalled £764 billion out of the total £3,400 billion assets under management as of 31st December 2007 with all Investment Management

Association members. Thus ethical funds account for twenty two per cent of all assets under management in the UK.

The ethical investing movement has also spread to the Continent, Australia, Canada and a few other developed countries. Such widespread prominence puts it in a position where it can no longer be neglected. In keeping with its commercial growth, academic research too has grown on this topic over the years. Some studies address the issue qualitatively i.e. how are ethical funds run, how do ethical investors think, why do investors choose to behave ethically, etc. The quantitative studies revolve around the issue of performance, they test the performance of ethical funds and usually compare the same with conventional funds and/or the market. All such studies use the mean-variance approach to compare performance. We feel that the latter approach tends to put unfair restrictions, it assumes that either the returns are normally distributed or the investor utility function is quadratic (Baron, 1977; Collins and Gbur, 1991; Johnstone and Lindley, 2010; Markowitz, 1959; Mossin, 1973). A quadratic utility function has a third derivative equal to zero and no fourth derivative and thus does not account for investors' preference for positive skewness and aversion to kurtosis. Thus we argue that a Second Order Stochastic Dominance approach implemented using Marginal Conditional Stochastic Dominance is better suited for performance evaluation since it works with minimal restrictions. It does not make any assumptions about return distributions and only requires that the investor utility function be concave i.e. non-decreasing with a negative second derivative or in other words investors prefer more to less and are risk averse. Another common feature amongst previous studies is the use of asset pricing

models such as CAPM, Fama-French, Carhart, etc.; this approach makes the rather bold assumption that the said models are a good representation of the reality of asset returns – which may not necessarily be the case. An MCSD approach is free from the need to specify such models.

This is the first study to apply a Marginal Conditional Stochastic Dominance approach to evaluate the performance of ethical funds and indices.

1.2 Research Questions

We have three research questions, each question will be addressed in a separate empirical chapter.

1.2.1 Research Question 1 – Active

The performance of ethical funds is a well studied area. Numerous studies have evaluated the performance of ethical funds and compared the same with conventional funds and/or the market. All studies use a Mean-Variance (MV) approach; an MV approach assumes that the return distributions are normal or the utility function of investors is quadratic. Several studies also use various asset pricing models to evaluate the fund's performance; these models are based on the assumption that they are a good representation of reality – this assumption too is restrictive. We test and compare performance under less restrictive assumptions using the Second Order Stochastic Dominance (SSD) approach implemented

using Marginal Conditional Stochastic Dominance (MCSD) which only assumes that the investor utility function is concave i.e. investors prefer more to less and that investors are risk averse. Secondly, no assumptions are made about the return distributions – normal or otherwise. Thirdly, the mean-variance approach only compares the first and second moments of the two return distributions while the MCSD approach compares the two distributions over the entire range thus producing a more robust result. And finally, an MSCD approach is free from the need of specifying asset pricing models i.e. making restrictive assumptions about the reality of asset returns.

Marginal Conditional Stochastic Dominance (MCSD) was first proposed by Shalit & Yitzhaki (1994) and further developed by Clark & Jokung (1999) and Clark, Jokung & Kassimatis (2011). Shalit & Yitzhaki (1994) originally answered the question, which asset MCSD-dominates another and thus would be preferred by all risk averse utility maximizing investors. Clark, Jokung & Kassimatis (2011) extend it to answer the question, if asset A dominates asset B then what weight of investment should be transferred from B to A. The amount of weight shifted from B to A can give us a tangible estimate of the said dominance. This was missing in the original MSCD approach which only establishes whether there is dominance or not but does not give a tangible effect that would have on the investor's portfolio.

Past studies (Mallin et. al., 1995; Gregory et. al., 1997; Kreander et. al., 2005; etc.) have used a matched pair technique. In this technique an ethical fund is matched with a similar conventional one and their performance is compared under mean-variance analysis and by using an asset pricing model. In order to establish

a suitable match the funds are matched by certain criteria. Different studies use various criteria but by and large the two funds are matched by size, age, country and investment objective. This is done to reasonably alleviate any other reasons for the difference in their performance other than their ethical and conventional natures. We find that another criterion can be introduced in order to make the matching more robust viz. fund management company. We believe that the fund management company may have an impact on performance due to its management practices, reputation to attract investments and employ fund managers. Thus in our study we match mutual funds using the criterion of age, size, investment objective, country and parent fund management company.

The matched pair approach does away with the problem of finding a suitable benchmark to judge the performance of the ethical funds against and is also well suited for the MCSD methodology. It does however suffer from the drawback that accurate matches can be sometimes difficult to find.

Our research question can be formally stated as: Do ethical funds dominate or are dominated by conventional funds when evaluated using a matched pair analysis implemented using an MCSD methodology.

This study, using a fresh approach to compare performance of ethical funds with conventional ones and the market, will make a significant contribution to the ongoing debate.

1.2.2 Research Question 2 – Passive

Our second research question deals with comparing the performance of ethical indices with that of conventional ones. In this case we compare performance of the FTSE 4Good ethical indices with that of conventional ones. We match the indices by the investment universe they represent. For example the FTSE4Good UK 50 index is matched with the UK FTSE 100 and so on. Past studies (Statman 2000 & 2006; Schroder, 2007 and Collison et. al., 2008) have compared the performance of ethical and conventional indices using asset pricing models & under the mean-variance framework. We propose to do so using an MCSD approach.

Thus our research question can be formally stated as: do ethical indices outperform or underperform conventional indices when evaluated using the MCSD methodology.

The results would prove beneficial to passive investors, both individual and institutional, who typically invest only in the index.

1.2.3 Research Question 3 – Criteria

Ethical funds operate under various ethical criteria. Some apply negative screening i.e. avoid investing in companies that belong to a particular sector; for example: tobacco, alcohol, gambling, etc. Some apply positive screening i.e. prefer to invest in companies with certain practices that are deemed desirable by the fund's investors; for example: companies with good corporate social

responsibility standards, low environmental pollution, etc. Other ethical funds may not apply screens but actively engage with the companies towards achieving higher ethical standards, better labour relations, etc. Some ethical funds may apply all of the aforementioned ethical strategies. Our third research question is regarding criteria: are certain type of ethical funds likely to outperform their ethical peers.

We plan to answer this question using the MCSD technique. This technique checks for MCSD between pairs of assets within a given portfolio. If asset A1 is found to dominate asset A2 then all risk averse utility maximizing investors would benefit from increasing their investment in A1 while reducing it in A2. Upon applying this procedure to the set of ethical funds we will be able to establish whether funds run using certain ethical criteria outperform their peers.

The results would help identify if there are certain ethical criterion that tend to outperform other ethical criteria. Once again attempts have been made in the past to answer this question using a mean-variance approach (Goldreyer et. al., 1999) and by using asset pricing models (Renneboog et. al., 2008a).

1.3 Summary

In this chapter we introduced our study and discussed our three research questions. We also talked briefly about previous attempts to answer the said questions and the proposed contribution of this study. Further we briefly reviewed

the methodologies involved. All these issues are discussed in more detail in later chapters.

Chapter 2 – Background

2.1 Introduction

In order to put this study in a proper context, it is necessary to first spend some time trying to look at the backdrop of the topic. Doing so would lead to a better understanding of this study. Thus in this chapter we discuss the key concepts and ideas surrounding the study. We begin with a brief history of ethical funds. Next we try to provide a formal definition for Socially Responsible Investment (SRI) and ethical funds. Further, we study the growth of ethical funds from obscurity to prominence and try to provide some reasoning for the same. Finally we look at the different ethical investment strategies employed by ethical funds and provide a critique of them. This chapter, in effect, highlights the significance of ethical funds and the importance of the topic being studied by us.

2.2 History of Ethical Funds

Ethical fund management has a much older history than one might imagine. Ethical investing first emerged in the US during the 1920's. It was initiated by church organisations who wanted to avoid investing in companies operating in the business of things they principally opposed, namely, alcohol, tobacco and the manufacturing of arms (Sparkes, 1995). Thus in 1928, the first ethical fund was set up in the US called the Pioneer Fund.

The above sentiment drew popular appeal during the 1960's civil, women and environmental rights movements (Kinder and Domini, 1997 and Henningsen, 2002). This culminated during the Vietnam War and led to the establishment of the first ethical investment fund, namely, the Pax World Fund which avoided investing in military related companies.

Similarly, during the 1980's, the issue of apartheid in South Africa led to the setting up of many ethical funds that avoided investing in companies that were connected with the racially discriminating regime. It was during these times in 1984 that the UK's first ethical fund, Friends Provident Stewardship was launched.

However it was only during the 1990's that ethical fund management started to become widely popular. With the setting up of special indices devoted to ethical companies, it started to come out of the shadows. It received legislative support from governments too, for example the UK government enacted pension regulations that required the trustees of pension funds to declare how their

investment strategy had taken into consideration social responsibility. Pension funds normally have huge amounts of money under their management and thus the latter gave a big push to the growth of ethical funds.

In the 21st century, ethical fund management has further grown in appeal and popularity. The growth of fund flows (fresh investments made by investors) into ethical funds has far outstripped that of traditional mutual funds (UKSIF, 2007). Thus ethically managed funds are slowly and gradually entering into the mainstream of the fund management industry.

2.3 Definitions

While going through the literature there often arises confusion as regards to the meanings attached to the commonly used terms. Secondly, to better grasp the discussions in the latter part of this thesis it is crucial to have a clear idea of what the key terms imply.

One of the earliest formal definitions of ethical investing was provided by Cowton (1994). According to him, ethical investment implies applying ethical and social criteria in the selection and management of investment portfolios normally comprising of company equity. Thus the investment decisions would not be solely based on financial considerations (financial return and financial risk) but would also take into account the nature of the company's business and the manner in which it carried out the same. According to him socially responsible investment (SRI) and ethical investment denoted the same idea. He considered them to be analogous.

Around the same time Sparkes (1995, p.4) defined ethical investment as:

> " It is probably time to clarify what is normally meant by 'ethical investment'. It does not mean a moral campaign to clean up the Stock Exchange, or raise the standards of those who work in the financial field. Ethical investment is straight forward, and simply means an investment philosophy that combines ethical or environmental goals with financial ones. "

After reading Sparkes' definition we realise that the true nature of ethical investing was not clearly understood even so far as the mid 1990's, hence the use of an illuminating tone at the beginning of the definition as also what may today be considered a humorous clarification to the effect that ethical investment is in no way connected to raising the standards of individuals working in the financial industry.

In a later paper, Sparkes (2001) tried to further clarify the definition of ethical investing by contrasting it with other commonly but wrongly considered to be synonymous terms. For instance he drew contrast between green investment and SRI. According to him green investment was only concerned with sustainable development while SRI was not just concerned with sustainable development but also with profit maximisation. This brings us to a critical point within the definition of SRI. SRI does not neglect profits. It seeks to maximise profits, just as any other form of investment strategy, but while doing so it seeks to be ethical or socially responsible by taking into account non-financial factors. In Sparkes' (2001, p.201) words:

> " The key distinguishing feature of socially responsible investment lies in its combination of social and environmental goals with the financial objective of achieving a return on invested capital approaching that of the market".

He supported his definition with the argument that institutional SRI investors were bound by a legal fiduciary duty not to accept a reduction in likely returns. He also argued that individual SRI investors would lose interest in SRI investments if the returns fell significantly below that of comparable non-SRI investments. Hence, in his view, SRI investors cannot be considered to be financially irrational.

This gives rise to a key debate: can these non-financial deliberations actually be considered to be ethical? This basically asks the question: what is ethical and who decides? For example, some ethical funds don't invest in companies manufacturing alcohol but there are many people who do not consider alcohol to be bad. Thus deciding what is ethical and what is not is a value call. Discussing this is beyond the scope of this thesis as this would constitute a philosophical debate which could lead to the production of a separate thesis on its own. Thus this research avoids making a judgement on what is ethical and what is not. Each fund has its own set of ethical guidelines and ethical experts on its boards ensure that the fund's investment strategy remains in line with those ethical principles. Secondly, each fund attracts investors who "agree" that the said principles indeed constitute ethical behaviour. Thus the problem of establishing what is ethical & what is not is solved by the investors' self selection.

Sparkes (2001, p.195) also categorised ethical investing as socially responsible investment (SRI) and socially directed investment (SDI). According to him:

> " Socially directed investment occurs when a subnormal return is voluntarily accepted for community development or other purposes. This is normally based upon a banking model rather than upon equity finance, and indeed is sometimes described as 'ethical banking' ".

Thus in his view SDI is associated with debt while SRI is associated with equity.

Over the years, the term SRI has come to denote both SRI and SDI. However, as far as the present thesis is concerned the use of the term SRI should be taken to mean equity investments only. To be more precise, our universe of equity investments is limited to listed mutual funds. Moreover, the terms SRI, ethical investment(s), ethical fund(s) and ethical investing should be understood to imply the same concept. This is the norm today as can be seen from the latest definitions of ethical investing available on the websites of the leading organisations in this field. A couple of those definitions have been listed below.

According to Ethical Investment Research Services website (EIRIS, 2008):

> " Ethical or socially responsible investment (as well as responsible and sustainable investment) are terms used to describe any area of the financial sector where the social, environmental and ethical principles of the investor (whether an individual or institution) influence which organisation or venture they choose to place their money with. It also encompasses how an investor might use their power as a shareholder

to encourage better environmental and social behaviour from the companies they invest in."

According to the Social Investment Forum website (SIF, 2008):

" SRI recognizes that corporate responsibility and societal concerns are valid parts of investment decisions. SRI considers both the investor's financial needs and an investment's impact on society. SRI investors encourage corporations to improve their practices on environmental, social, and governance issues. You may also hear SRI-like approaches to investing referred to as mission investing, responsible investing, double or triple bottom line investing, ethical investing, sustainable investing, or green investing."

2.4 Increase in Prominence of Ethical Funds

Ethical investing started off as a practice of the church and other religious organisations but with the passage of time it has grown in prominence both amongst institutional and individual investors. Something that was a little known fad has turned into a significant area of the fund management industry. We shall first try to establish its growth to prominence and then take a brief look at the key reasons for the said growth.

2.4.1 Assets Under Management

Within the mutual fund industry a key statistic to ascertain the prominence of any fund is the Assets Under Management (AUM) of that fund. This is the current market value of all the assets owned and managed by the fund on behalf of its investors. It is a measure of how much money the fund has been able to attract to itself based on its past performance, reputation, quality of management team and in addition to these, in the case of ethical funds, its ethical principles, that is, the ethical guidelines followed by the fund while making and managing investments. Clearly, larger the size of AUM the more popular is the fund with its investors. The total assets under management of ethical funds were miniscule two decades ago but they have been on the rise ever since. Over the last few years the rise in AUM of ethical funds has far outstripped that in traditional funds. Table 2.1 shows the growth of ethical funds in the UK. This growth has been replicated in other developed economies too, namely, USA, Europe, Canada and Australia. However the ethical movement has yet to make inroads into Asia. Table 2.2 shows the growth of ethically managed funds in the aforementioned developed countries.

Table 2.1: The size of ethically managed funds in the UK (Source: EIRIS - Key ethical / socially responsible investment (SRI) statistics, 2008).

Year	Pooled SRI fund size (£m)
1989 (July)	199
1990	not available
1991 (July)	318
1992 (May)	372
1993 (May)	448
1994 (July)	672
1995 (June)	792
1996 (June)	1,088
1997 (June)	1,465
1998 (June)	2,198
1999 (June)	2,447
2000 (June)	3,296
2001 (June)	4,025
2002 (Mar)	3,800
2003 (June)	3,570
2004 (June)	4,555
2004 (Dec)	5.532
2005 (Dec)	6,078
2006 (Dec)	7,490
2007 (Dec)	8,881

From Table 2.1 we observe that the AUM of SRI funds in the UK have more than doubled in the last 4 years. A similar picture arises from Table 2.2.

Table 2.2: Global rise to prominence of ethical funds. This table presents the total assets under management of SRI portfolios including retail funds and institutional funds such as pension funds and insurance companies, and the assets under management of retail SRI mutual funds in the US, Europe, Canada and Australia, at year ends. (adapted from Renneboog et. al., 2008b).

Year	**US**		**EUROPE**		**CANADA**		**AUSTRALIA**	
	Total AUM ($b)	Retail AUM ($b)	Total AUM ($b)	Retail AUM ($b)	Total AUM ($b)	Retail AUM ($b)	Total AUM ($b)	Retail AUM ($b)
1995	639	12						
1997	1185	96						0.1
1999	2159	154		11				0.2
2001	2323	136		13	33	6.6	1	0.9
2003	2164	151	470	15	34	6.7	2	1.1
2005	2290	179	1400	30	55	12.5	6	

2.4.2 Reasons for the Rise to Prominence

So why have investments in ethical funds increased at such a rapid pace. The answer to that question is multi faceted. On the one hand there has been a rise in the awareness about ethical issues and about being socially responsible. Why has this happened only over the past two decades and not before that is an anthropological question. However in the interest of our future arguments we try to provide some insights in to the phenomenon.

In the early 1990's there were very few ethically managed funds and the SRI movement was on the fringes. With the passage of time the debate on ethics became popular which in turn increased the popularity of ethical fund management which gave rise to more investments which gave rise to more ethically managed funds which in turn gave importance to the ethical debate – thus creating a positive spiral of growth. Adding fuel to fire were the hugely

prominent and well covered issues of global warming and sustainable development. This led to a rise in popular sentiment towards SRI, not just amongst the investors but also amongst fund managers. A survey conducted by Mercer in 2004, of fund managers, found that 36 percent of managers in the US, 69 per cent of managers in Europe and 89 per cent of fund managers in Asia believed that ethical fund management would be in the investment mainstream in the coming decade.

We shall now look at a few important factors that have led to the popularity of and formalised the framework for ethically managed funds. The most important push to the growth of SRI has been provided by government regulations (Vyvyan et. al., 2007). For example, in July 2001 the Pensions Act of 1995 was amended by the UK and it became the first country to require trustees of pension funds to disclose whether ethical, social and environmental concerns had been taken into account while making their investment decisions. Following the British, four other countries in Europe, namely, Belgium, Italy, Sweden and Germany passed similar regulations. All these regulations require pension funds to declare and or incorporate ethical, social and environmental factors into their investment policies and decisions. France went a step further by requiring all listed companies to publish social and environmental information as regards its business activities. Similarly all listed companies in Australia are required to submit an annual social responsibility report. Table 2.3 lists the various regulations adopted in different countries.

Table 2.3: Various regulations in support of SRI in different countries (adapted from Renneboog et. al., 2008b).

Country	SRI related regulations
Australia	In a 2001 bill it is stated that all investment firms' product disclosure statements should include a description of "the extent to which labour standards or environmental, social or ethical considerations are taken into account". Since 2001, all listed companies on the Australian Stock Exchange are required to make an annual social responsibility report
Belgium	In 2001, Belgium passed the 'Vandebroucke' law, which requires pension funds to report the degree to which their investments take into account social, ethical and environmental aspects
France	In May 2001, the legislation ''New Economic Regulations" came into force requiring listed companies to publish social and environmental information in their annual reports Since February 2001 managers of the Employee Savings Plans are required to consider social, environmental or ethical considerations when buying and selling shares
Germany	Since 1991, the Renewable Energy Act gives a tax advantage to closed-end funds to invest in wind energy. Since January 2002, certified private pension schemes and occupational pension schemes 'must inform the members in writing, whether and in what form ethical, social, or ecological aspects are taken into consideration when investing the paid-in contributions'
Italy	Since September 2004 pension funds are required to disclose non-financial factors (including social, environmental and ethical factors) influencing their investment decisions
Netherlands	In 1995, the Dutch Tax Office introduced a 'Green Savings and Investment Plan', which applies a tax deduction for green investments, such as wind and solar energy, and organic farming
Sweden	Since January 2002, Swedish national pension funds are obliged to incorporate environmental and ethical aspects in their investment policies
UK	In July 2000, the Amendment to 1995 Pensions Act came into force, requiring trustees of occupational pension funds in the UK to disclose in the Statement of Investment Principles ''the extent (if at all) to which social, environmental and ethical considerations are taken into account in the selection, retention and realization of investments" The Trustee Act 2000 came into force in February 2001. Charity trustees must ensure that investments are suitable to a charity's stated aims, including applying ethical considerations to investments. In 2002, The Cabinet Office in the UK published the Review of Charity Law in 2002, which proposed that all charities with an annual income of over £1 m should report on the extent to which social, environmental and ethical issues are taken into account in their investment policy. The Home Office accepted these recommendations in 2003. The Association of British Insurers (ABI) published a disclosure guideline in 2001, asking listed companies to report on material social, environmental and ethical risks relevant to their business activities
US	Section 406 of the Sarbanes-Oxley Act, which came into effect in July 2002, requires companies to disclose a written code of ethics adopted by their CEO, chief financial officer and chief accountant

These governmental resolutions contributed to the growth in institutional ethical investments. They also resulted to an increase in awareness of ethical concerns in the investment process which might have led to an increase in individual ethical investments. But most importantly they provided the much needed recognition, regulatory framework and support for the principles of SRI. In a way the governments were saying, 'to invest ethically is the right thing to do'.

With the rise in popularity and size of ethical funds, the financial support framework started setting itself up to benefit from this rising trend in fund management. Commercial and mainstream organisations like FTSE started to collaborate with charitable organisations involved in SRI research like EIRIS to set up an index for ethical funds. According to the FTSE (2008) website:

> "The FTSE4Good Index Series has been designed to measure the performance of companies that meet globally recognised corporate responsibility standards, and to facilitate investment in those companies. Transparent management and criteria alongside the FTSE brand make FTSE4Good the index of choice for the creation of Responsible Investment products."

The same website further states:

> "FTSE works in association with EIRIS, the Ethical Investment Research Service, to research company corporate responsibility performance. FTSE4Good indices are reviewed semi-annually in September and March, by the FTSE4Good Policy Committee. The

research process is undertaken around these dates, with the distribution of an extensive questionnaire year-round. EIRIS manages the research and analysis globally in order to cover the FTSE4Good Index eligible universe either directly or through a network of partner research organisations."

The FTSE4Good index series comprises of a number of indices representing different regions in the world in which ethical fund management is widely practised. There are indices for Europe, the US, the UK and a Global Index too. Similar indices were set up across different markets. Table 2.4 provides a brief list of the indices.

Table 2.4: List of Ethical Indices.

Sr. No.	**Name of Index/Index Series**
1	Dow Jones Sustainability Group Indexes
2	FTSE4Good Series
3	Calvert Social Index
4	Jantzi Social Index
5	Ethical Canadian Index

Another factor for the rise to prominence of ethical funds has been their competitive performance as compared to conventional funds. We will look at the issue of performance of ethical funds in the next chapter where we shall discuss the issue formally. For the present to illustrate the point of competitive performance we plot the performance of the ethical FTSE4Good UK 50 Index with that of the conventional FTSE 100 UK Index. Looking at Figure 2.1 we find that the two indices move in quite a similar fashion hence indicating that there is not much difference in their performances. The latter fact is further confirmed by looking at their chart for weekly returns in Figure 2.2.

Figure 2.1: Comparative performance of the ethical FTSE4Good UK 50 Index with the conventional FTSE 100 UK Index (Data source: Yahoo Finance, 2010).

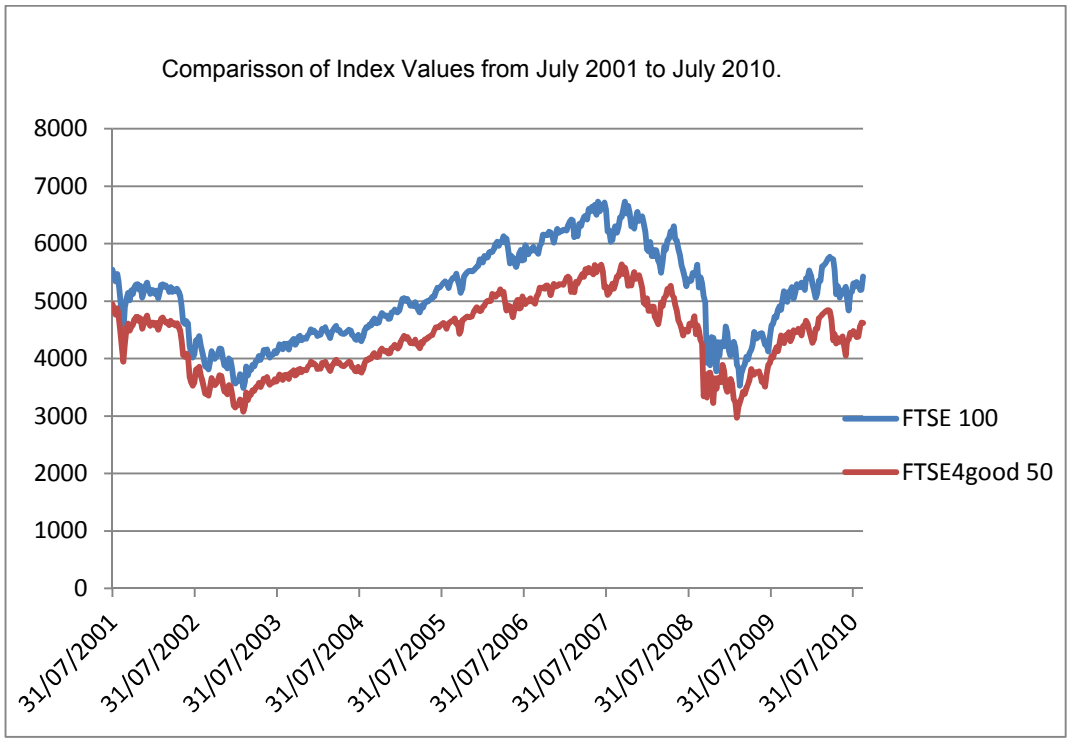
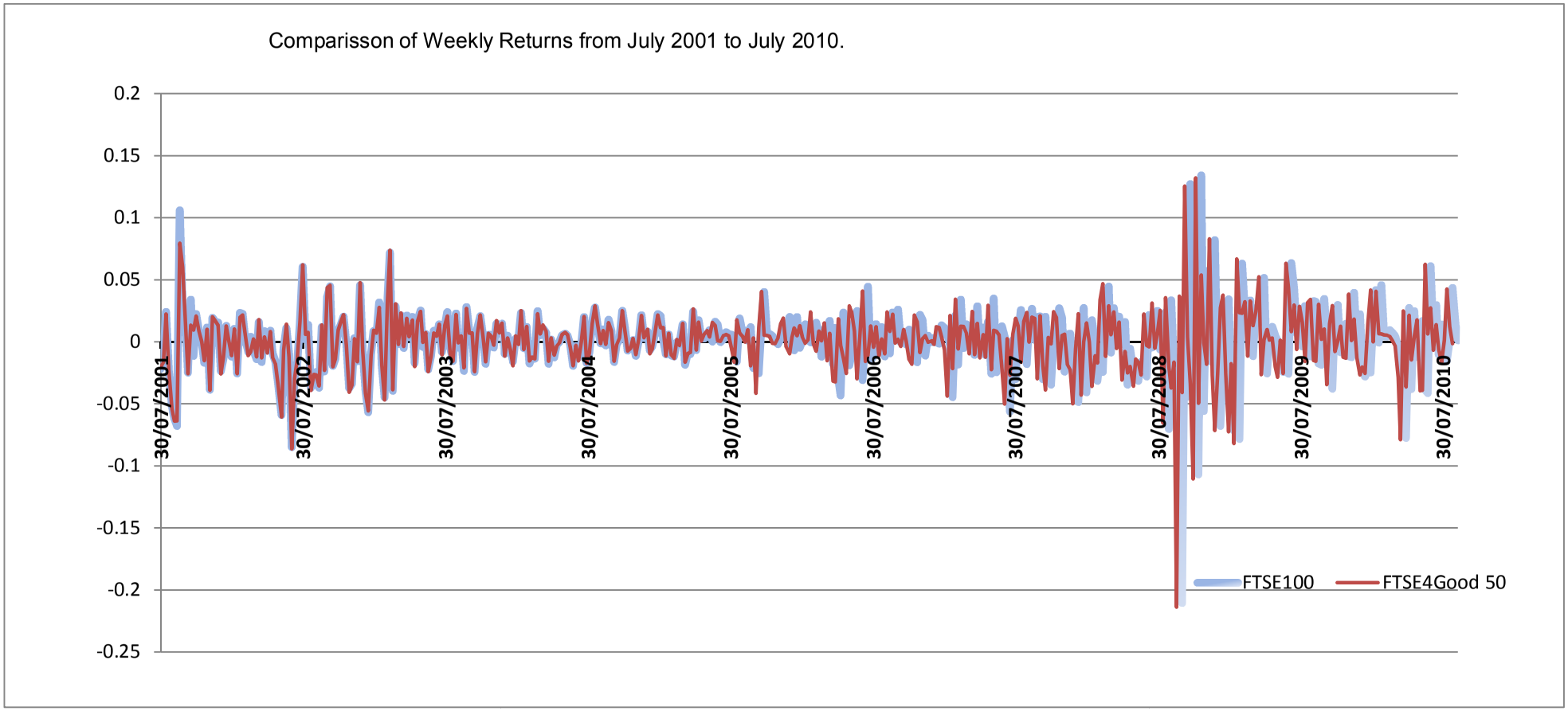


Figure 2.2: Comparative performance of weekly returns for the ethical FTSE4Good UK 50 Index with the conventional FTSE 100 UK Index (Data source: Yahoo Finance, 2010)



2.5 Methods of Ethical Funds

Finally in this section we take a brief look at the various methods employed by ethical funds to make investment decisions. It is not just interesting to know how they go about their 'ethical business' but also vital to our future analysis.

Fund have different ethical strategies and different ways to integrate the said strategies into its investment decisions. We shall look at the former in a while. As far as implementing the ethical strategies is concerned, funds generally use one of the following ways:

- An independent ethical committee formulates the ethical policies of the fund and has the final say on policy changes and investment decisions.
- The fund management team develops and implements both the ethical and investment policies.
- A mix of the previous two approaches – an ethical committee formulates the overall policy while the fund management team is responsible and empowered to implement the ethical policy and make investment decisions (EIRIS, 2008).

The three chief ethical strategies employed by funds are: screening, preference and engagement. Ethical funds may use more than one of the following strategies in combination with each other. The EIRIS (2008) website provides a good definition of the three strategies:

> "Screening is probably the best known amongst consumers – this is where companies may be excluded because of their involvement in certain activities such as nuclear power, the fur trade, tobacco and so

forth. This approach also applies where companies may be included for positive contributions to society and the environment such as energy efficient technology, organic farming for example. Many of the long-standing ethical funds have some form of screening.

A preference or best-in-class approach would apply social, environmental and ethical guidelines to give a preferred selection when all other factors are equal such as sector type and financial performance. So for example, a fund manager who has to invest in oil stocks may have a best-in-class approach and select the oil company with the best environmental management and policies in place.

The third approach – engagement – does not necessarily exclude, include or prefer companies but rather the investor (or representative such as the fund manager) will actively encourage companies to adopt social and environmental best practices."

2.5.1 Screening

Screening is the oldest strategy, it was used by the churches in the US and that in fact led to the beginning of the whole ethical investing movement. The churches decided that they did not wish to invest in companies that were in the business of goods that were considered unethical by the church, for example, tobacco, alcohol and so on. This is known as negative screening. The way this is implemented now

a days is: from within the stock universe companies involved in activities that are considered unethical by the fund are removed. From this modified stock universe companies are selected for investment based on purely financial criterion. The most common negative screens employed by ethical funds are tobacco, alcohol, gambling, weapons and nuclear power (Renneboog et. al., 2008b).

Traditionally screening only used a negative approach (exclusion of stocks from the investment universe) but now screening is also used in a positive manner, that is, to specifically include in the investment portfolio companies that make a positive contribution to society, for example, companies working in the development and manufacturing of energy efficient technologies, organic farming and so on. Most SRI portfolios are nowadays based on positive screening, which means investing in shares that meet superior social, ethical and environmental standards. The most commonly applied positive screens are, corporate governance, labour relations, impact on the environment, sustainable nature of the investments and the stimulation of cultural diversity (Renneboog et. al., 2008b). Table 2.5 provides a comprehensive list of both positive and negative screens employed by ethical funds.

2.5.2 Preference

The second ethical strategy, preference, uses a best in class approach by only investing in the companies with the best SRI practices in any sector. This is quite similar to positive screening with one critical difference. While positive screening may choose not to invest in a particular sector at all, the best in class approach

does not exclude any sectors or industries but instead within that sector it chooses to invest in the company with the best ethical record.

2.5.3 Engagement

The third strategy is commonly referred to as shareholder activism. In this case the ethical investors or the ethical fund manager by virtue of his or her shareholding in the company has a position of power over it in the form of voting rights. He or she then uses the voting rights in order to influence the company to adopt social, ethical and environmental best practices. The latter can also be brought about in a softer way in the form of private discussions between the company management and the ethical fund manager(s). A much tougher tactic employed nowadays, especially in the US is to file shareholder resolutions (proposals) on the topics of corporate governance, climate change, pollution and so on. These resolutions are then presented for a vote to all the owners of the company. Most of the times a shareholder resolution may not be able to win the majority vote but it does succeed in bringing the issues in question to the attention of the management and if it is supported by a large number of investors does eventually persuade management to incorporate the said concerns in its decision making (SIF, 2008).

It is important to distinguish between the kind of shareholder activism practiced by non-governmental organisations (NGO's) & campaigning activists and ethical investors. The former acquire just the bare minimum shares required for them to be allowed to attend the annual general meeting of the company. Their main aim

is not to constructively engage management but to destructively prevent management from conducting its business. They are only concerned about the issues at hand and don't care even if their activism against the company leads to financial losses for the company as well as their small amount of investment. SRI investors on the other hand have a significant financial share in the company and thus would not like to see the share price of the same slide. They prefer to constructively engage management in discussions, sometimes privately, in order to convince them of the benefits of their ethical ideas. They are interested in bettering the performance of the company and not closing it down. Having said that, if a company fails to satisfy their ethical standards they may choose to sell their shareholding in the said company and part ways. Table 2.6 makes a good attempt to exhibit the differences between harsh NGO shareholder activism and the activism of SRI investors.

Table 2.5: The positive and negative investment screens employed by ethical funds (adapted from Renneboog et. al., 2008b).

Screens	Definitions	Type
Tobacco	Avoid manufacturers of tobacco products	-
Alcohol	Avoid firms that produce, market, or otherwise promote the consumption of alcoholic beverages	-
Gambling	Avoid casinos and suppliers of gambling equipment	-
Defence/weapons	Avoid firms producing weapons for domestic or foreign militaries, or firearms for personal use	-
Nuclear power	Avoid manufacturers of nuclear reactors or related equipment and companies that operate nuclear power plants	-
Irresponsible foreign operations	Avoid firms with investments in government-controlled or private firms located in oppressive regimes such as Burma or China, or firms which mistreat the indigenous peoples of developing countries	-
Pornography/adult entertainment	Avoid publishers of pornographic magazines; production studios that produce offensive video and audio tapes; companies that are major sponsors of graphic sex and violence on television	-
Abortion/birth control	Avoid providers of abortion; manufacturers of abortion drugs and birth control products; insurance companies that pay for elective abortions (where not mandated by law); companies that provide financial support to Planned Parenthood	-
Labour relations and workplace conditions	Seek firms with strong union relationships, employee empowerment, and/or employee profit sharing. Avoid firms exploiting their workforce and sweatshops	+ -
Environment	Seek firms with proactive involvement in recycling, waste reduction, and environmental cleanup Avoid firms producing toxic products, and contributing to global warming	+ -
Corporate governance	Seek companies demonstrating ‘‘best practices” related to board independence and elections, auditor independence, executive compensation, expensing of options, voting rights and/or other governance issues Avoid firms with antitrust violations, consumer fraud, and marketing scandals	+ -

Screens	Definitions	Type
Business practice	Seek companies committed to sustainability through investments in R&D, quality assurance, product safety	+
Employment diversity	Seek firms pursuing an active policy related to the employment of minorities, women, gays/lesbians, and/or disabled persons who ought to be represented amongst senior management	+
Human rights	Seek firms promoting human rights standards Avoid firms which are complicit in human rights violations	+ -
Animal testing	Seek firms promoting the respectful treatment of animals Avoid firms with animal testing and firms producing hunting/trapping equipment or using animals in end products	+ -
Renewable energy	Seek firms producing power derived from renewable energy sources	+
Biotechnology	Seek firms that support sustainable agriculture, biodiversity, local farmers, and industrial applications of biotechnology Avoid firms involved in the promotion or development of genetic engineering for agricultural applications	+ -
Community involvement	Seek firms with proactive investments in the local community by sponsoring charitable donations, employee volunteerism, and/or housing and educational programs	+
Shareholder activism	The SRI funds that attempt to influence company actions through direct dialogue with management and/ or voting at Annual General Meetings	+
Non-married	Avoid insurance companies that give coverage to non-married couples	-
Healthcare/ pharmaceuticals	Avoid healthcare industries (used by funds targeting the ‘‘Christian Scientist” religious group)	-
Interest-based financial institutions	Avoid financial institutions that derive a significant portion of their income from interest earnings (on loans or fixed income securities). (Used by funds managed according to Islamic principles)	-
Pork producers	Avoid companies that derive a significant portion of their income from the manufacturing or marketing of pork products. (Used by funds managed according to Islamic principles)	-

Table 2.6: Differences between NGO shareholder activism and SRI shareholder activism (adapted from Sparkes, 2001).

NGO Activism	SRI Activism
Single issue focus	Multi-issue concern
No financial concerns	Strong financial interest
Seeks confrontation	Seeks engagement
Seeks publicity	Avoids publicity

2.6 Summary

In this chapter we looked at the backdrop of the study. We began by looking at the history of ethical fund management. Next we tried to develop a formal definition for ethical funds. Further, we looked at the phenomenal growth of ethical funds in the past decade or so. We also discussed the reasons for the said growth and rise to prominence of ethical funds. Finally we studied the various strategies employed by ethical funds. This chapter will go a long way in aiding the understanding of the ethical debate and more specifically the setting around our research thesis. It also highlights the importance of our study.

Chapter 3 – Literature Review

3.1 Introduction

In this chapter we review the research that has been conducted in the past on the topic of ethical funds. We especially draw light on theories our research is based upon and will be adding to.

A number of studies have tried to test the performance of ethical funds and compare the same with conventional ones. Various methods have been used to study performance. To begin with we shall take a general look at the methods used; next we review previous studies – their hypotheses, data used, methodologies adopted and findings. Then we will look at the theories surrounding ethical investing, specifically the issue of ethical utility; we shall review studies that have attempted to model the said ethical utility. And finally, we present our proposed methodology based on Marginal Conditional Stochastic Dominance which will attempt to look at the issue of performance using a fresh approach.

3.2 Performance Evaluation Methods

All the methods used in previous studies for testing the performance of ethical funds are based upon mean variance analysis. This assumes that either the returns are normally distributed or the investor utility function is quadratic.

The most common and perhaps the oldest measures used to evaluate mutual fund performance are: the Sharpe Ratio (Sharpe, 1966) and the Jensen's alpha (Jensen, 1968). The Sharpe ratio is defined as the excess return of a portfolio (calculated as the expected return minus the risk free rate) per unit of risk which is measured as the standard deviation of that expected return. The Jensen's alpha is used to calculate the excess return of a portfolio. Simplistically speaking this is the alpha term in the CAPM regression. If this alpha is positive then the fund is said to outperform the market portfolio and vice versa.

This brings us to the discussion of the models used to evaluate fund performance. The simplest model which is still widely used is the Capital Asset Pricing Model (CAPM). This is a single index model which states that the return of a portfolio depends only on the return of the market (Sharpe, 1964; Lintner, 1965). Table 3.1 shows the mathematical representations of the Sharpe ratio, Jensen's Alpha, Treynor Index and the CAPM.

Table 3.1: Mathematical representations of the Sharpe Ratio, CAPM , Jensen's Alpha and Treynor Index.

Sharpe Ratio	Sharpe Ratio = $\frac{r_i - r_f}{\sigma_i}$ Where: r_i = mean return of asset r_f = risk free rate for the given period σ_i = standard deviation of asset returns
CAPM	$r_{it} - r_{ft} = \alpha_i + \beta_i (r_{mt} - r_{ft}) + \varepsilon_{it}$ Where: r_{it} = return of asset at times t r_{ft} = risk free rate at time t α_i = Excess return or Jensen's alpha β_i = Beta for the asset r_{mt} = return of the market at time t ε_{it} = random error term at time t
Jensen's Alpha	This is the alpha term (α_i) in the above CAPM regression. If this alpha is positive then the fund is said to outperform the market portfolio and vice versa.
Treynor Index	Treynor Ratio = $\frac{r_i - r_f}{\beta_i}$ Where: r_i = mean return of asset r_f = risk free rate β_i = Beta of the asset relative to the market portfolio – this is the beta estimate (β_i) from the above CAPM regression.

Even though the CAPM is widely used it is quite simplistic in its treatment thus other more complex models were developed; these are generally multi-index models which use a number of factors to capture the portfolio returns as opposed to the single index CAPM which uses only one factor viz. market returns.

One of the first multifactor models were developed by Fama and French (1993). They used three factors, namely, the market, the size of the stock and the book to market ratio. Fama and French argue that these factors contribute to returns i.e. small stocks generally outperform the market as also do value stocks i.e. stocks with a high book value to market price ratio. Their model compensates for the historic excess returns of small caps and value stocks over the market as a whole. Once again the alpha is checked to see if there is any excess returns produced by the portfolio. If alpha is positive then the portfolio produces excess returns, that is, it outperforms the benchmark. The mathematical model is shown below:

$$r_{i,t} - r_{f,t} = \alpha_{FF,i} + \beta_{m,i}(r_{m,t} - r_{f,t}) + \beta_{s,i} * r_{smb,t} + \beta_{h,i} * r_{hml,t} + \varepsilon_{i,t}$$

Where:

$\alpha_{FF,i}$ = excess returns over those predicted by the Fama and French model for asset i

$\beta_{m,i}$ = Beta for the market factor

$\beta_{s,i}$ = Beta for size factor

$\beta_{h,i}$ = Beta for book price to market price ratio factor

Carhart in 1997 extended the Fama-French three factor model by adding a fourth factor, namely, momentum. The momentum factor measures the current month's difference in returns between the previous year's best performing and worst performing stocks. The argument behind this factor is that returns tend to be determined by market momentum. The mathematical model is shown below:

$$r_{i,t} - r_{f,t} = \alpha_{C,i} + \beta_{m,i}(r_{m,t} - r_{f,t}) + \beta_{s,i} * r_{smb,t} + \beta_{h,i} * r_{hml,t} + \beta_{p,i} * r_{pr|yr,\,t} + \varepsilon_{i,t}$$

Where:

$\alpha_{C,i}$ = excess returns over those predicted by the Carhart model for asset i

$\beta_{m,i}$ = Beta for the market factor

$\beta_{s,i}$ = Beta for size factor

$\beta_{h,i}$ = Beta for book price to market price ratio factor

$\beta_{p,i}$ = Beta for momentum factor

3.3 Performance Studies

The hypothesis of all performance studies are either of the two listed below:

1. Ethical funds underperform conventional funds. The reason for that being, ethical criteria reduce the size of the investment universe of ethical funds and this limits diversification which in turn impacts optimisation (with respect to risk and returns) of the fund's performance. Secondly, it has been argued that the so called sinful sectors, namely, tobacco, gambling and alcohol tend to be more resilient to economic downturns and in fact outperform the general stock markets (Hong and Kacperczyk, 2005). By not investing in these stocks the ethical funds reduce their potential returns.

2. Ethical funds outperform conventional funds. The reasons in support of the same being that the good SRI performance of a company signals good management which in turn leads to better financial performance. Thus implying that stocks selected using the ethical criteria leads to the selection of companies with better management skills. Secondly, good ethical practices of a company protects it from future litigation & scandals and the associated costs. However, it is important to note here that this particular hypothesis assumes that these two factors are not already priced by the wider market and are only taken into consideration by ethical investors who then in turn benefit from it (Renneboog et. al., 2008b). This

might have been true in the past but today more and more conventional funds are taking into account SRI factors, for instance, corporate governance, corporate social responsibility, etc. while making investment decisions. Thus the marginal advantage, if at all, available to ethical funds seems to have reduced over the years.

One of the earliest performance study was conducted by Luther et. al. (1992), using UK data from 1984-1990 they studied the performance of ethical funds. They used only the CAPM for performance evaluation as did many other studies (Luther and Matako, 1994; Hamilton et. al., 1993; Mallin et. al., 1995; Goldreyer et. al., 1999; Statman, 2000). None of these studies found any statistically significant evidence of either under-performance or out-performance. Thus implying that the performance of the two types of funds are identical when evaluated using only the CAPM model.

Other studies used one of the advanced models, discussed in the previous section, as a replacement for the CAPM (Gregory et. al., 1997; Kreander et. al., 2005; Renneboog et. al., 2006 and 2008a) or in addition to it i.e. some studies used more than two models for performance evaluation (Geczy et. al., 2003; Schroder et. al., 2004; Bauer et. al., 2005; Bauer et. al., 2006 and Renneboog et. al., 2008a). Despite using advanced models, none of these studies could find any statistically significant difference in the performance of ethical and conventional funds.

All previous studies use either a conventional market index or an ethical market index or both as benchmarks. They use either ethical funds or conventional funds

as the reference group. However no study has been able to find any statistically significant evidence in favour of either of the two hypotheses. The only consistent finding was that SRI funds generally tend to have a higher exposure to small cap companies. However recent studies dispute this finding too (Bauer et. al., 2006; Bollen, 2007).

Goldreyer et. al. (1999) extended their performance evaluation study to evaluate the effect of screens on the performance of ethical funds. They found that ethical funds employing positive screens in their investment process outperform ethical funds that do not employ positive screening. For once the finding was statistically significant. This implies that there is financial value to be derived by investing in companies with positive SRI practices. They studied 49 US ethical equity & bond funds. Within those they identified 28 that employed positive screening & 10 that didn't. They defined positive screening as, "a portfolio selection strategy in which the portfolio manager specifically includes firms in his/her portfolio that conduct some positively regarded social policy ..." (p. 25). They calculated 3 portfolio measures for each fund viz. Jensen's Alpha, Sharpe Ratio & Treynor Ratio and then compared the average of the ratios for the set of funds that employ positive screening with the other set; they used the Wilcoxon Signed- Rank test to check if the difference in the two means was statistically significant. They found that the differences were significant for the Jensen's Alpha but not for the other two ratios.

The only other study in the area of performance & ethical criteria is by Renneboog et. al. (2008a). They found that ethical funds which invest in firms employing a community involvement policy or have an in house SRI team to conduct ethical research to decide which firms to invest in, have better returns

than ethical funds which do not do so. They define community involvement as, "providing services to low-income individuals or small businesses in local communities, such as job training, child care, and healthcare" (p. 320). They studied the performance of ethical funds globally i.e. across 17 countries. In order to isolate the effect of ethical criteria on performance they ran a regression with risk adjusted fund returns as the dependent variable and the following independent variables: various screening activities (ethical criteria) employed by the funds viz. Activism policy, community involvement, in house ethical research, Islamic principles & number of screens employed. As control variables they used fund characteristics (age, size, risk, management fees, load fees, fund family size) investment styles (investing abroad & the four factors of the Carhart (1997) model viz. β_{MKT}, β_{SMB}, β_{HML}, and β_{MOM}) and fixed effects (country & time). The last item is used to control for unobserved differences in money flows across various time periods & countries. Upon running the regression they found: ethical funds that adopted community involvement as an investment criteria generated an extra 3.6% per annum in returns. Similarly, funds that employed an in house ethical research team generated 1.2% per annum in extra returns.

Statman (2000) took a different approach, he argued that comparing the performance of ethical funds with conventional funds was a flawed method since the individual fund performances depended not just on the nature of the fund (ethical or conventional) but also other fund specific factors such as manager performance, management fees and so on. To control for these and hence judge only the performance of ethical versus conventional investments he chose to compare the performance of the Domini Social Index (an ethically screened

version of the conventional S&P 500) with the S&P 500. He used Sharpe ratio and CAPM to estimate Jensen's alpha for the said comparison; he found no significant difference in the performance of the two indices.

Later Statman (2006) extended his earlier study, he chose to compare the performance of four popular ethical indices with the S&P500 index. The four ethical indices he used were: Domini Social Index, Calvert's Social Index, Citizen's Index and Dow Jones Sustainability US Index. Thus this study is an improvement over the previous one in the sense that it compares three more ethical indices with the S&P 500 as also has a larger time horizon extending up to 2004. Also, in this study he used the Fama-French three factor model to estimate alpha as opposed to the more simpler CAPM in the previous one. However, all four indices are constituted of US equities. Thus this study as well as the previous one was limited to US equity indices. He found that the returns of the ethical indices exceeded the returns of the S&P500 however the results were not statistically significant thus leading to the conclusion, "We cannot reject the hypothesis that returns of socially responsible companies are equal to those of conventional companies" (Statman, 2006, p. 108).

Schroder (2007) was the first extensive study on the performance of ethical indices. He studied the performance of 29 ethical indices worldwide. He used a CAPM model to estimate alpha. He argued against the need for a multi factor model like the Fama-French 3 factor model (1993) or the Carhart 4 factor model (1997); he provided three arguments for the same: "Firstly, the SRI indices do not officially follow specific investment styles. Secondly, the indices are only adjusted infrequently, in most cases only once or twice a year. And thirdly, almost

all of the SRI indices are closely related to a single conventional benchmark index" (Schroder, 2007, p. 335). He presented the high adjusted R-square values (greater than 90%) of the CAPM regression (the ethical index being the dependent variable and the relevant benchmark market index being the independent variable) to show that the model had been correctly specified. When he compared the performance of the ethical indices with their relevant benchmark market portfolio, he found no significant evidence of under/out performance.

Collison et. al. (2008) was the first study to look exclusively at the performance of the FTSE4Good ethical index series. The period of their study extends from 1996 – 2005. Although the FTSE4Good indices were launched in July 2001, FTSE4Good provided the authors with simulated historical data from 1996 for promotional purposes. Schroder (2007) has done this too with respect to the FTSE4Good indices used in his study i.e. he too has used simulated data starting from 1996 as opposed to 2001 when the FTSE4Good indices were actually launched. This is counter-intuitive; passive (index) investors choose to either mimic the index themselves or invest in an index fund that does so for them. How can such an investor possibly invest in an index that does not exist. Fortunately Collison et. al. (2008), but not Schroder (2007), separately compare performance for a time period that is post the launch of the index series i.e. from July 2001upto 2005. In fact what they found is, for the overall period from 1996 – 2005 the ethical indices outperformed the respective market indices while for a period post the actual launch of the series, the ethical indices underperformed the market indices. In their own words, "Once the indices went 'live', their returns were on average negative, riskier and lower than those achieved by their base universe

indices" (Collison et. al., 2008, p.27). However later they surprisingly conclude by saying, "The performance of the indices suggests that the adoption of an SRI strategy need not be at the expense of returns for investors. Once risk is included in the analysis, the FTSE4Good indices achieve the same level of return as their base universe indices, despite restricting their attention to socially responsible firms" (Collison et. al., 2008, p.27).

Mallin et. al. (1995) were the first to use a matched pair analysis i.e. they first matched the ethical funds with similar conventional ones using the criteria of size, age, investment universe and country and then compared their performance. They argued that using such an approach allowed one to control for confounding variables as also do away with the need for identifying a suitable benchmark. In their paper, they matched 29 ethical funds with 29 conventional funds in the UK by fund size & age and compared their performance using Jensen's Alpha, Sharpe Ratio & Treynor Ratio. They did not find a statistically significant difference between the performance of ethical and conventional funds. However, they did find that on average both ethical and conventional funds underperform the market on a risk adjusted basis.

Kreander et. al. (2005) extended the matched pair technique to pan-European data. They matched 30 ethical funds with 30 conventional ones and compared performance using Sharpe Ratio, Treynor Ratio, CAPM and other advanced asset pricing models but could not find any significant difference in performance. However, they too found that overall both types of funds underperformed their respective benchmark market indices. They argued that a matched pair analysis is free from the effects of survivor bias since both sets contain only surviving funds

and hence the effect is cancelled out, however on average it may overstate the performance of both types of funds since the dead funds (which are more likely to be poor performers) are not included in the study (Kreander et. al., 2005).

More recently Gregory and Whittaker (2007) applied the matched paired analysis using the Carhart four factor model (Carhart, 1997) to evaluate performance of ethical funds in the UK. They found that there were no significant differences in performance between ethical and conventional funds. However, they did find that ethical funds with a domestic bias tend to be persistent in their performance. Thus investors could enhance their possibility of gains by sticking with past winners.

Amenc and Sourd (2008) studied the performance of ethical funds with investments in firms listed in France, the Euro zone and Europe over the period 2002-2007. They used the Fama and French three-factor model to compute alpha i.e. risk adjusted excess returns. They did not find any significant out-performance or under-performance.

Jones et. al. (2008) evaluated the performance of ethical funds in Australia from 1986-2005. They used the Fama and French three-factor model and found that ethical funds significantly underperform the market in Australia. The underperformance was to the extent of 1.52% annually for the 2000-2005 period while it was 0.88% over the entire sample period.

Fernandez and Matallin (2008) was the first study to look at the performance of ethical funds in the Spanish retail market. They use two methods to test the performance. The first one is the commonly used multi-factor model regression. Using this they found that in all cases the financial performance of ethical funds to

be either similar or superior to conventional funds. But since there were only 13 ethical funds as opposed to 2064 conventional funds in the sample, they felt that a more fair comparison would be achieved by comparing the performance of 13 ethical funds with 13 randomly chosen conventional funds. They achieve this by using a bootstrap method to select 10,000 random samples of 13 funds from the set of 2064 conventional funds. Using this method they found that ethical funds provide similar performance as conventional funds. In conclusion they argued that since ethical investors derive more than just financial utility from their ethical investments and since the financial performance of ethical funds is similar to conventional funds, when taking into account a zero or positive ethical utility derived by the investor from investing ethically, the performance of ethical funds proves to be superior to that of conventional ones.

Consolandi et. al. (2009) tried to ascertain if Corporate Social Responsibility (CSR) factors have an impact on equity performance. The way they go about this is: they use the Dow Jones Stoxx 600 index (DJS600) and its subset the Dow Jones Sustainability Stoxx Index (DJSSI). They identify the stocks from the former that are not included in the latter. They use these stocks to construct a new index they call Surrogate Complementary Index (SCI). Now they compare the performance of the DJSSI and SCI. The former is made up of European corporation stocks that have high CSR scores from amongst all the stocks present in the DJS600. The latter is made up of the rest DJS600 stocks. Their results were, to quote them, ‘ambiguous’.

3.4 Non-Financial Utility

Almost all of the above mentioned studies and methods assume:

1. An investor only derives financial utility from his/her investments.
2. Either the utility function of an investor is quadratic or that the investment returns are normally distributed.

In both cases, the investor utility function has been restricted.

Statman (2004) argues that investors in addition to financial utility also derive non-financial utility from their investments. He call this 'expressive utility'. It is his view that investors care not just about risk and return but also about the expressive nature of their investments. He defined 'expressive characteristics' as those attributes that convey to others (as well as ourselves) our tastes, values and social standing.

Specifically speaking about ethical investors, Beal et. al. (2005) propose that ethical investors have three potential motives for investing ethically.

1. Financial Returns
2. Non-Wealth Returns
3. Social Change

In support of the first motive they state:

> "If investors actually behave as traditional finance theory assumes, ethical investment would only exist because it provides the

opportunity for equivalent return at relatively lower risk or provides higher returns for the same level of risk as 'standard' funds" (p.67).

However, reviewing previous studies on the performance of socially responsible investments, they found that such investments neither over nor under perform their conventional counterparts. Thus they concluded that the financial returns motive cannot explain ethical investing.

This lead them to develop the second motive. They drew on a study by Auger et. al. (2003) which stated that consumers were ready to pay a significantly higher amount for an ethical product. Beal et. al. (2005) argued that if SRI funds could be viewed as products then it would be reasonable to assume that SRI investors had non-wealth motives for making such investments. They labelled such investors as 'consumption investors'. A term they borrowed from Cullis et. al. (1992).

The third motive according to them is the least important as it is too farfetched for an individual shareholder or even a group of investors to accomplish. They concluded that the main benefit derived by social change investors is one of personal psychic return, a feel good effect obtained by not supporting undesirable activities. This motive in our view is simply an extension of the second one and does not merit its own category. Thus in our view the only two motives of investing ethically are: financial returns and non-wealth returns. Similarity in the performance of ethical and conventional funds rules out the former leaving us with only one motive for ethical investing: non-financial returns, that is, ethical utility.

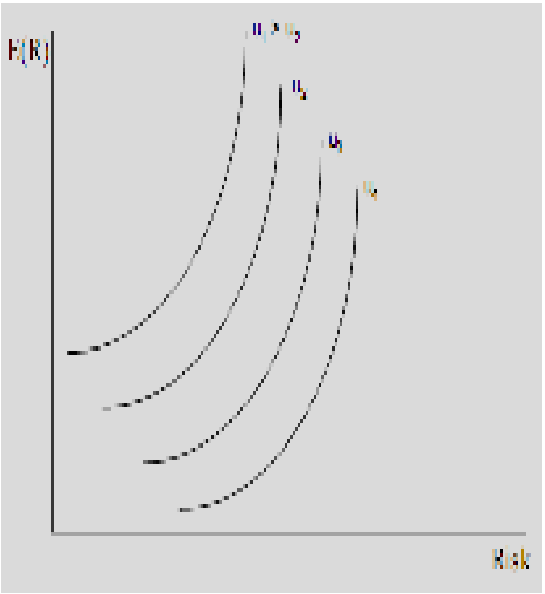
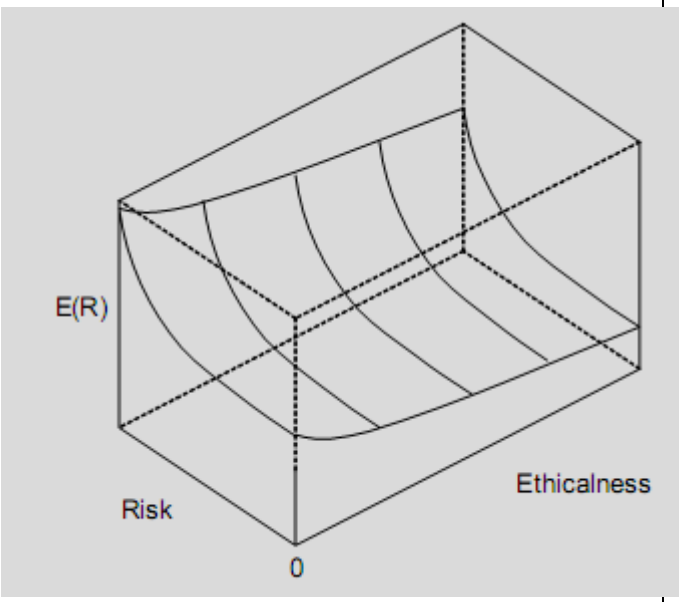
The most significant achievement of the Beal et. al. (2005) paper is an attempt to model this ethical utility. They have attempted to model it using the following approaches.

The first approach treats ethical utility as similar to the one derived by a gambler participating in a gamble for pleasure but with very little financial involvement. This approach, in our view, is flawed considering the huge sums of money invested in ethical funds both by individual and institutional investors.

The second approach incorporates the ethical aspect in the investor utility function. They extend the utility function of a conventional investor consisting of two parameters, risk and return, to include a third parameter they label 'degree of ethicalness'. Since the ethical utility function is three dimensional, the indifference curves translate into indifference planes. Table 3.2 shows a side by side representation of the two utility functions and the indifference curves and planes associated with them. In our view, this approach is a valid one since it accounts for both the financial as well as ethical aspects of ethical investing but the problem lies in finding a valid quantitative and generalisable measure for ethical utility. The key question is: how do we measure ethical utility?

Statman (2005, p.5) states, "We are moving toward asset-pricing models that combine utilitarian and expressive characteristics and toward a better understanding of market efficiency". Even Fama and French (2007) agree that ethical investors do derive more than just financial utility from their investments. But the problem still remains: how do we measure non-financial gain?

Table 3.2: Utility functions and indifference curves of conventional and ethical investors (Source: Beal et. al., 2005).

Conventional Investor	**Ethical Investor**
Utility Function: $U = f(E_R, \sigma_R)$ E_R = Expected Return	Utility Function: $U = f(E_R, \sigma_R, e)$ σ_R = Risk, e = Ethical Parameter
Indifference Curves: 	Indifference Planes: 

3.5 Data Envelopment Analysis

Data Envelopment Analysis (DEA) was introduced by Charnes et. al. (1978, 1979) and is now a commonly used method in operational research. DEA is based on linear programming. The decision making unit takes one or many inputs and produces one or multiple outputs. The efficiency of the decision making unit is found by solving a linear program which takes into consideration all inputs and outputs.

All standard performance measures evaluate performance over the two parameters of risk and return. DEA allows the use of more than two parameters to evaluate performance. Thus in addition to risk and return it can also provide for a third parameter i.e. the ethical level of the investment to be considered while evaluating performance. But still the question remains, how do we measure the ethical level?

Basso and Funari (2003, 2007) have made a decent attempt to answer the question. In their first paper on the performance of ethical funds they argued that when performance of ethical mutual funds is analysed one cannot disregard the ethical component and take into account solely the portfolio return and risk. They proposed the use of Data Envelopment Analysis (DEA) to evaluate the performance of ethical funds. Using DEA allowed for the consideration of the ethical level of the fund along with the two regular parameters of risk and return while evaluating performance. In their 2003 paper, they developed three models for evaluating performance. The models are briefly discussed below.

1. Ethical level is exogenously fixed – the ethical level of a fund is fixed by the investors or founding guidelines of the fund and thus is beyond the control of the fund managers i.e. fund managers cannot have an impact on the ethical level. But they do not talk about how to measure the said ethical level.
2. Ethical level is considered as a binary variable – this implies that funds that are classified as ethical are given an ethical level value of 0 and others a value of 1. This is a simplistic treatment, one that has already been attempted by several researchers in the past using non DEA methods; for example: by using "ethical" as a dummy variable in the CAPM, Fama French & Carhart model regressions. Therefore, this approach offers no improvement towards estimating ethical utility.
3. Ethical level is taken as a categorical variable – in this case the ethical level of a fund is measured on a ordinal scale from zero (for conventional funds) to a high positive number for 'highly' ethical funds. In our view this is a step in the right direction. The issue however was, how to measure the said ethical level? This was answered in their 2007 paper.

Basso and Funari (2007) extended their earlier research to formulate a method to estimate the ethical level of a fund. They gathered information from 'SRI fund services', a service operated by Eurosif in association with Vigeo-Avanzi and Morningstar Europe, about the number of positive and negative screen implemented by an ethical fund as also whether an ethical fund has an ethical committee that defines ethical guidelines and controls the actions of the fund managers. They assign each of the factors weights and compute a final sum that

serves as an estimate of the ethical level of the said fund. In principle, the way this works is, the more number of screens that a fund employs the more will be its ethical score. If a fund has an ethical committee then its ethical score improves as well.

Using this ethical level parameter in their DEA model they find that higher performance levels are obtained by ethical funds when the ethical parameter is taken into consideration in addition to risk and returns. When only the latter two are taken into consideration, the performance scores of ethical funds drop below those of conventional funds.

In our view this is a good first step in the direction of developing a performance evaluation model that takes into consideration the ethical level of the fund along with the regular two parameters of risk and return. However, we are not entirely convinced of the method developed to estimate the ethical level of a particular fund. Firstly, such information may not be readily available. Secondly, some ethical funds may not employ any screens (in fact screening has become less popular in recent times) but still be ethical in their approach. And finally, a study by Glawischnig et. al. (2010) which looked at the effectiveness of a DEA based approach for evaluating the performance of investment funds found that the DEA methodology produced inconsistent results and hence must be used with caution.

3.6 Marginal Conditional Stochastic Dominance (MCSD)

We propose to use another approach to test the performance of ethical funds, our approach is based on the concept of Stochastic Dominance (SD); more specifically Second Order Stochastic Dominance (SSD) implemented using Marginal Conditional Stochastic Dominance (MCSD).

SD has never been used to evaluate the performance of ethical funds even though the SD approach is less restrictive than the traditional Mean Variance (MV) approach. However the problem with SD is that it takes a large number of iterations (comparisons) for it to converge. We talk about these and other issues in detail below.

The theory and application of Stochastic Dominance with respect to economics and finance was first proposed by Hadar and Russell (1969), Hanoch and Levy (1969) and Rothschild and Stiglitz (1970). Stochastic Dominance takes into account the entire return distributions while comparing performance as opposed to MV analysis which only considers the first two moments (mean and variance) of the distribution. In addition to this, MV analysis assumes that the investor utility function is either quadratic or that the return distributions are normal. Both these assumptions are restrictive.

Returns may not be normally distributed. This can be tested using statistical tests but none of the previous studies talk about this, nor do they state whether tests were conducted to check the return distributions for normality. During empirical

testing for this thesis we found that is almost all cases the return series were non-normally distributed.

The other assumption, that the investor utility function is quadratic, is highly restrictive since there may be a number of investors who have a concave utility function but one that is not quadratic. In fact past studies have shown that investors show a preference for positive skewness and an aversion to kurtosis (Kraus et. al., 1976; Athayde et. al., 1997; Dittmar, 2002; Post et. al., 2003). This cannot be incorporated into a quadratic utility function since its third derivate is zero and fourth derivative is undefined. Generally speaking, we can never know the exact utility function for all investors thus we make some assumptions; SSD makes much weaker assumptions than MV thus performance evaluation using SSD would hold for a much larger set of utility functions and hence for a greater number of investors than MV. In effect, the set of utility functions under which MV holds is a subset of the set of utility functions under which SSD holds. This clearly demonstrates the superiority of SSD over MV. SSD only assumes that the investor utility function is non-decreasing (axiom of monotonicity i.e. investors prefer more to less) and that investors are risk averse (i.e. diminishing rate of marginal utility). Thus giving us a concave utility function. In support of SSD, Copeland et. al. (2005) state that if an asset demonstrated SSD then it will be preferred by all risk averse investors regardless of the specific shape of their utility functions. We would like to add, all risk averse investors includes ethical investors as well.

Even if the above two conditions (normality & quadratic utility function) are met, MCSD is still superior to MV since it considers the entire range of the

distributions while comparing the two assets as opposed to only comparing the first two moments, namely, mean and variance.

Last but not the least, the SD approach is free from the need to correctly specify asset pricing models (Abhyankar et. al., 2008); an asset pricing model based approach makes a rather bold assumption, that the specified models (CAPM, Fama-French, Carhart, etc.) accurately represent the reality of asset returns.

On the other hand the disadvantage of using SSD is, it involves a large number of pair wise comparisons. In our case, for comparing amongst N number of funds, it would require [N*(N-1)]/2 number of pair wise comparisons. We can reduce the number of pair wise comparisons by applying certain necessary conditions and the property of transitivity (Levy, 2006) but still the process takes quite long to converge. Instead the approach proposed by Shalit and Yitzhaki (1994) using the concept of MCSD converges more quickly. The other limitation of SSD is that the approach is descriptive in nature. It tells us that asset A dominates asset B but it does not give us a quantitative measure for the said dominance. This limitation continues on to MCSD as well. This problem is solved by Clark, Jokung & Kassimatis (2011).

MCSD was first proposed by Shalit and Yitzhaki (1994). In their own words, "Marginal Conditional Stochastic Dominance (MCSD) states the probabilistic conditions under which all risk-averse individuals, given a portfolio of assets, prefer to increase the share of one risky asset over that of another" (p.671). Elsewhere in the same paper they state, "We define Marginal Conditional Stochastic Dominance (MCSD) as follows: Given a portfolio of risky assets,

under what conditions do all risk-averse investors prefer marginally increasing the share of one asset over another? MCSD is not an alternative to SSD; it is an instrument used to reach SSD" (p.672). MCSD is more intuitive in the real world sense because investors tend to make marginal decisions with respect to their portfolios as opposed to selling their entire portfolio and starting afresh.

The drawbacks of MCSD are: firstly, it is a more confining concept than SSD since it considers only marginal changes in assets within the context of the portfolio. Secondly, it is limited to pair wise comparisons. Finally, MCSD tells us that asset B is dominated by asset A, hence the investor should marginally move his investment from asset B to asset A but MCSD does not tell us the amount of investment that should be moved from B to A in order to make the portfolio MCSD efficient which in turn implies SSD efficiency (Yitzhaki and Mayshar, 2001). Clark, Jokung & Kassimatis (2011) provide a solution to the latter problem, they combine MCSD with a generalisation of the Clark & Jokung (1999) 50% portfolio rule to develop a methodology to answer the critical question: if asset A MCSD-dominates asset B then how much weight from asset B should be moved to asset A.

Another drawback of SSD & MCSD both is that in certain cases it can produce inconclusive results, for example when comparing two assets A and B we may find that neither asset dominates the other. However, we feel it is better to not reach a conclusion than reach a wrong one as may be the case when studies are restricted to MV analysis without talking about pertinent issues like investor attitudes towards skewness & kurtosis and non-normality of the return distributions.

3.7 MCSD Implementation

According to the MCSD theorem developed by Shalit and Yitzhaki (1994), given a portfolio α, asset A1 dominates asset A2 for all concave utility functions if and only if:

ACC (A1) ≥ ACC (A2) with at least one strong inequality

Where:

ACC = Absolute Concentration Curves

More simply speaking, asset A1 dominates asset A2 if the ACC of A1 lies above the ACC of A2. If A1 does indeed dominate A2 then all risk averse investors would be better off i.e. improve their utility by increasing their investment in A1 while reducing it in A2. Thus clearly, within the given portfolio context, A1 has outperformed A2. The same paper illustrates with a simple example how to calculate the said ACCs. The MCSD test is implemented as shown below.

Say we have two assets: A1 & A2, we use their common market benchmark (usually a broad based index) as the wealth ranking index. We take the return series for all three; we have N = number of observations in each series. We use the market index returns as the wealth index to sort or rank the two asset A1 & A2 returns from lowest to highest. The returns are ranked in ascending order since we are working under the assumption of diminishing marginal utility:

U(1) – U(0) > U(2) – U(1)

where U is utility and 0, 1 & 2 are returns.

Next, each of the terms in both assets' return series is multiplied by 1/N to obtain equally weighted returns. Each observation is given an equal weight of 1/N since it has an equal probability of occurring. We now take the cumulative sum of this weighted returns series for each asset i.e. each term in the cumulative sum series is the sum of all previous terms of the weighted returns series. For example, the 3rd term of the cumulative return series of A1 is the sum of the 1st and 2nd terms from the weighted return series of A1. This cumulative return series for A1 is known as the ACC of A1. Similarly we calculate the ACC for the other asset A2. Next we compare the two ACCs calculated above at each of the N points. According to the MCSD criteria, an asset dominates the other if its ACC is either equal to or greater than the ACC of the other asset at all the points, with at least one strong inequality.

We may also choose to compare the performance of both assets with the market (wealth ranking index). In order to do so we need to calculate the ACC of the market using the same procedure as detailed above. The ACC of the market is known by a special name i.e. ALC (Absolute Lorenz Curve). We now compare this ALC, one at a time, with the ACC of the two assets A1 and A2. If the market portfolio is dominated by an asset then increasing the share of that one asset while reducing the proportion of all the other assets in the market portfolio improves the portfolio for all risk-averse investors (Shalit and Yitzhaki, 1994). Thus clearly if an asset dominates the market then it has outperformed the market.

3.8 Summary

In this chapter we looked at the literature surrounding our study. We review various theories about performance of ethical funds, methods used by previous studies to test for the same as also critically analyse findings of past studies. Finally, we present our proposed methodology and argue towards its suitability while also identifying its limitations.

Chapter 4 – Active: Performance of Actively Managed Funds

4.1 Introduction

Ethical Investments also known as Socially Responsible Investments have a long history but have only grown to prominence in the recent past. In the beginning, ethical investing was treated as a fad by the wider finance community. A fad they thought would either pass off soon or be limited to the fringes. But as things stand now, according to the Social Investment Forum website (2008), ethical investments account for $2.71 trillion out of the $25.1 trillion total assets under management in the US. Thus roughly eleven per cent of all assets under management with mutual funds in the US are ethically managed. According to the UKSIF (2008), the assets under management of ethical funds in the UK totalled £764 billion out of the total £3,400 billion assets under management as of 31st December 2007 with all Investment Management Association members. Thus ethical investments account for twenty two per cent of all assets under management in the UK. Such widespread prominence puts it in a position where it can no longer be neglected

Theoretically speaking, since ethical investors face a smaller or more restricted investment universe than conventional investors, the latter should be able to

outperform the former; this leads to an interesting question: do ethical investors pay a price (in terms of poorer returns on their ethical investments as compared to conventional investors) for being ethical? Previous studies have tried to answer this question by comparing the performance of ethical funds with conventional ones or with the benchmark market index. For example, Hamilton et. al. (1993) compared the performance of US ethical funds with randomly selected conventional ones; Luther et. al. (1994) compared the performance of UK ethical funds with the FTSE all share index; Bauer et. al. (2005) compared US, UK and German ethical funds with a large number of conventional funds (both dead and alive) in each country.

The above approaches ignore the fact that the difference in performance may arise due to other factors like fund size, age, investment universe, etc. So in order to isolate the effect of the ethical nature of the investment on performance other studies like Mallin et. al. (1995), Gregory et. al. (1997, 2007), Kreander et. al. (2005) used a matched pair approach i.e. they first matched the ethical funds with similar conventional ones using the criteria of size, age, investment universe and country and then compared their performance.

We subscribe to the above technique and add an extra variable to the matching criteria: fund management company. In our view this gives us even closer matches. Fund management company is an important variable since it influences investment practices and the ability to attract and retain talented fund managers not just based on remuneration but also the work culture and intellectual freedom offered to the managers within the organisation. Thus the difference in performance between ethical and conventional funds could be due to the company

managing the fund and not their individual natures. Even though perfect matches are difficult to find, this in our view gives us really close matches.

Previous studies have used asset pricing models like the CAPM (Sharpe, 1964; Lintner, 1965), Fama-French 3 factor model (Fama & French 1993), Carhart 4 factor model (Carhart, 1997), etc. in order to calculate alpha i.e. excess performance and compare the same across ethical and conventional funds as also the benchmark market index. These models introduce their own set of assumptions into the analysis, not least that the factors are sufficient enough to capture the complex reality of asset returns.

Marginal Conditional Stochastic Dominance (MCSD) on the other hand imposes minimal restrictions i.e. investor utility function is increasing and investors are risk averse. Hence we test and compare performance using the MCSD methodology, this is the first study in this area to do so. Secondly, the mean-variance approach only compares the first and second moments of the two return distributions while the MCSD approach compares the two distributions over the entire range thus producing a more robust result.

This is also the first study to talk about the issue of normality and test for it. All previous studies have simply assumed the data to be normally distributed or that the non-normality of the return distributions has no impact on results. As per previous literature (Kraus et. al., 1976; Athayde et. al., 1997; Dittmar, 2002; Post et. al., 2003) and as our tests have shown, both these assumptions are erroneous.

And finally, equity investors can be broadly defined as two types: active and passive. Passive investors are those who believe in the efficient market hypothesis

(Fama, 1970) and hence don't try to outperform the market but instead invest in the market index to do away with stock specific risk. The most cost effective way of doing so is to invest in the selected market index via a index fund i.e. a mutual fund that tracks the index. Active investors on the other hand are those who believe it is possible to outperform the market and hence "actively" seek out investments that they think will be able to beat the market.

When active yet ethical investors look to invest their money they would quite naturally seek out actively managed ethical funds. Hence it is greatly beneficial to compare the performance of the same with conventional ones. Efficient market hypothesis states that investors cannot beat the market but even after several decades of research this is still an open question. We find that active management convincingly beats the market.

4.2 Literature Review

The performance of ethical funds is a well studied area. Numerous studies have evaluated the performance of ethical funds and compared the same with conventional funds or indices. One of the earliest performance study was conducted by Luther et. al. (1992), using UK data from 1984-1990 they studied the performance of ethical funds. They used only the CAPM for performance evaluation as did many other studies (Luther et. al., 1994; Hamilton et. al., 1993; Mallin et. al., 1995; Goldreyer et. al., 1999). None of these studies found any statistically significant evidence of either under-performance or out-performance.

Thus implying that the performance of the two types of funds are identical when evaluated using only the CAPM model.

Other studies used one of the multi-factor models as a replacement for the CAPM or in addition to it (Gregory et. al., 1997; Kreander et. al., 2005) while some studies even used more than two models for performance evaluation (Geczy et. al., 2003; Bauer et. al., 2005; Bauer et. al., 2006 and Renneboog et. al., 2008a). Despite using advanced models, none of these studies could find any statistically significant difference in the performance of ethical and conventional funds.

Mallin et. al. (1995) were the first to use a matched pair analysis. They argued that using such an approach allowed one to control for confounding variables as also do away with the need of identifying a suitable benchmark. They matched 29 ethical funds with 29 conventional funds in the UK by fund size & age and compared their performance using Jensen's Alpha, Sharpe Ratio & Treynor Ratio. They did not find a statistically significant difference between the performance of ethical and conventional funds. However, they did find that on average both ethical and conventional funds underperform the market on a risk adjusted basis.

Kreander et. al. (2005) extended the matched pair technique to pan-European data. They matched 30 ethical funds with 30 conventional ones and compared performance using Sharpe Ratio, Treynor Ratio, CAPM and other advanced asset pricing models but could not find any significant difference in performance. However, they too found that overall both types of funds underperformed their respective benchmark market indices. They argued that a matched pair analysis is free from the effects of survivor bias since both sets contain only surviving funds

and hence the effect is cancelled out, however on average it may overstate the performance of both types of funds since the dead funds (which are more likely to be poor performers) are not included in the study.

More recently Gregory & Whittaker (2007) applied the matched paired analysis using the Carhart four factor model (Carhart, 1997) to evaluate performance of ethical funds in the UK. They found that there were no significant differences in performance between ethical and conventional funds. However, they did find that ethical funds with a domestic bias tend to be persistent in their performance. Thus investors could enhance their possibility of gains by sticking with past winners.

All previous studies use Mean Variance analysis (MV) and/or asset pricing models for comparing performance, ours is the first study to use Marginal Conditional Stochastic Dominance (MCSD) to compare performance. As compared to the methods used by previous studies, MCSD is a better method for comparing performance. Justifications for the same have been provided in Section 3.6 of this thesis i.e. chapter 3 sub-section 6, pp. 63 – 65.

The drawbacks of using MCSD as a methodology are: it entails pair wise comparisons and can prove to be inconclusive at times. The first drawback is not a problem for us since we are using a matched pair analysis which in any case necessitates pair wise comparisons. The second drawback is a valid one, MCSD may at times produce inconclusive results, for example when comparing two assets A and B we may find that neither asset dominates the other. However, we feel it is better to not reach a conclusion than reach a wrong one as may be the case when studies are restricted to MV analysis without accounting for pertinent

issues like investor attitudes towards skewness & kurtosis and non-normality of the return distributions.

4.3 Data Set

To create the data set we first identify all the ethical mutual funds (also known as unit trusts and investment trusts) listed in the UK. For this we use the EIRIS website which lists names and details of UK ethical funds. Since we are focussed on equity investments we delete from this list funds that have less than 70% of assets invested in shares. This is the standard threshold used for qualifying a fund as an equity fund, not just in previous studies but also in the financial services industry (Kreander et. al. 2005; Renneboog et. al. 2008a). We also delete index funds as also those that are funds of funds i.e. funds which invest in other ethical funds. Next we cross check our list for robustness with the list of ethical funds available on the Investment Management Association (IMA) website. The IMA is the parent body for asset management companies in the UK. Eventually we end up with 42 ethical funds.

Since we will be using a matched pair methodology we need to identify conventional funds to be matched with the ethical ones over the following criteria: age, size, investment objective, management company and country. We go into the prospectus of each ethical fund and look closely at their investment objectives, countries and sectors they invest in, benchmarks used, size and age. We then use this information to find funds run by the same management company with similar characteristics bar one i.e. the ethical one. A couple of fund management

companies only run ethical funds and hence we could not find conventional funds to match with them. In a few other cases close matches could not be found and hence we had to eliminate those funds from our data set. Finally we end up with 23 closely matched pairs of ethical and conventional funds. To apply the MCSD technique we need a market index to rank the wealth outcomes, we use the common benchmark index for both types of funds in each pair. Hence each pair comprises of one market index, one ethical fund and one conventional fund. Table 4.1 shows the 23 pairs used in this study. Out of the 23 pairs, 13 pairs invest only in the UK market while 10 pairs invest globally; this fact is reflected by their respective benchmark indices.

This size of the data set is similar to those used in previous studies that applied the matched pairs technique to UK data. Previous studies limited themselves to matching across the following criteria: size, age & investment universe. We introduce one more factor, fund management company; this in our view enhances the effectiveness of the matching technique since this factor is likely to have a significant impact on performance.

When it comes to matching across size, previous studies have used various approaches: some match for size at the beginning of the data period (Mallin et. al., 1995), some match in the middle of the data period (Gregory et. al., 1997) while others match every year (Gil-Bazo et. al., 2010). Since we did not have access to historical data on size we matched the funds at the end of the data period.

Table 4.1 shows the list of ethical & conventional fund pairs used in this study.

Pair	Ethical Funds in the UK			Pair	Matched Conventional UK Funds			Benchmark
ID	Fund Name	Launch Date	Size (£M)	ID	Fund Name	Launch Date	Size (£M)	Index
1	Aberdeen Responsible UK Equity	09/05/2006	21	1	Aberdeen UK Equity	16/12/2005	176	FTSE all share
2	AEGON Ethical Equity	01/04/1989	262	2	AEGON UK Equity	01/08/1985	323	FTSE all share
3	Allianz RCM Global Eco Trends	14/02/2008	13	3	Allianz RCM Dynamic Growth	11/10/2001	73	MSCI World
4	Aviva Investors UK Ethical	10/05/1999	234	4	Aviva Investors UK Growth	01/06/1989	188	FTSE all share
5	Aviva Investors S. F. Absolute Growth	19/02/2001	67	5	Aviva Investors World Leaders	14/02/2000	52	MSCI World
6	Aviva Investors S. F. European Growth	19/02/2001	138	6	Aviva Investors European Equity	02/06/1986	185	FTSE W. EU ex UK
7	Aviva Investors S. F. UK Growth	19/02/2001	135	7	Aviva Investors UK Focus	05/11/2001	128	FTSE all share
8	F&C Stewardship Income	13/10/1987	318	8	F&C UK Equity Income	05/11/1968	1173	FTSE all share
9	F&C Stewardship International	13/10/1987	585	9	F&C Global Growth	09/09/1987	154	MSCI World
10	Family Charities Ethical	30/03/1982	374	10	Family Asset Trust	03/09/1990	43	FTSE all share
11	Halifax Ethical - Mgmt Scottish Widows	04/01/1994	57	11	Scottish Widows Global Growth	01/11/1994	85	FTSE World
12	Henderson Global Care Growth	01/08/1991	230	12	Henderson Global Innovation	18/02/1982	539	MSCI World
13	Henderson Global Care Managed	01/03/1996	222	13	Henderson Multi Manager Managed	30/06/1997	243	MSCI World
14	Henderson Industries of the Future	20/01/1995	202	14	Henderson International	01/10/1974	298	MSCI World
15	Jupiter Ecology	01/04/1988	403	15	Jupiter Global Managed	16/02/1998	303	FTSE World
16	Jupiter Environmental Income	22/11/1999	40	16	Jupiter Growth & Income	17/11/1997	199	FTSE all share
17	Legal & General Ethical	05/07/1999	176	17	Legal & General Growth	01/11/2000	227	FTSE all share
18	Marlborough Ethical	19/12/2005	7	18	Marlborough UK Equity Income	12/07/1995	26	FTSE all share
19	Premier Ethical	07/07/1986	61	19	Premier UK Strategic Growth	21/06/1972	60	FTSE all share
20	Scottish Widows Environmental Investor	29/06/1989	176	20	Scottish Widows UK Select Growth	12/08/1981	305	FTSE all share
21	Scottish Widows Ethical	12/09/1987	76	21	Scottish Widows UK Select Growth	12/08/1981	305	FTSE all share
22	Standard Life UK Ethical	16/02/1998	129	22	Standard Life UK Opportunities	25/11/2002	233	FTSE all share
23	St. James Place Ethical	06/04/1999	105	23	St. James Place Global	08/01/2007	237	MSCI World

To check for robustness of our matches, we test our matched pairs statistically across the two quantitative parameters of size & age and find that the differences between them are statistically insignificant at the 5% level.

Next we collect monthly closing prices for the 46 funds from DataStream. Monthly closing prices are declared by the mutual fund companies after deducting their day to day expenses like transactions costs, depository fees, management fees and other administrative expenses. Mutual funds issue two main classes of units based on dividend payouts i.e. income versus accumulating; the former pay out regular cash dividends to the investors while the latter reinvest the said dividends back into the fund. While collecting data we ensure that we collect prices for similar type of fund units for both the ethical and conventional fund in each pair i.e. if we have an income type of ethical fund then we collect data for income type of units for the conventional fund as well. Each pair has its own data period over which performance is compared, the data period is self selected by the age of the younger fund within the pair. The end date for all data periods is July 2011. Next we calculate an arithmetic return series for each fund and benchmark index using the formula below:

$$R_{i,t} = (P_{i,t} / P_{i,t-1}) - 1$$

Where:

$R_{i,t}$ = Return for fund/index i in month t

$P_{i,t}$ = Closing price for fund/index i in month t

$P_{i,t-1}$ = Closing price for fund/index i in month t-1

We use arithmetic returns since they have been used by Shalit & Yitzhaki (1994) as well as by Clark, Jokung & Kassimatis (2011). Even though the use of log returns is more common in Finance literature, we must use arithmetic returns while working with MCSD because log returns although additive across time are not additive across asset weights within a portfolio, whereas arithmetic returns are.

Since normally distributed data is an important assumption of mean variance analysis, we test each return series for normality. We use the Shapiro-Wilk test since it is widely considered to be the most accurate test for normality. It has been argued that equity data is more likely to be log-normally distributed than normally distributed since equity prices cannot be negative, hence we also test to see if the data is log-normally distributed using the Shapiro-Wilk test. We find similar results in both cases. We list here test results for the arithmetic return series since they are used in our study. As argued earlier, there is ample evidence in literature to suggest that investors prefer positive skewness and eschew excess kurtosis, hence we also calculate the skewness and kurtosis statistics. Table 4.2 lists descriptive statistics for the 23 pairs. We find that the return series are non-normally distributed in 88% of the cases (61/69 return series are non-normally distributed) with statistically significant (at the 5% level) negative skewness in 67% of the cases (46/69 return series) and statistically significant (at the 5% level) excess kurtosis in 80% of the cases (55/69 return series). These findings substantially weaken the case for using a Mean-Variance approach to compare performance.

Table 4.2: Descriptive statistics for the fund pairs.

Pair ID	Type	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S.Test **	K.Test ***
1	M	-0.1850	0.1414	0.0013	0.0602	-.381	1.131	Yes	INSIG	INSIG
	E	-0.1797	0.1544	0.0039	0.0607	-.353	1.278	Yes	INSIG	SIG
	C	-0.1855	0.1558	0.0037	0.0616	-.384	1.421	No	INSIG	SIG
2	M	-0.1850	0.1414	0.0043	0.0466	-.424	1.420	No	SIG	SIG
	E	-0.1313	0.1363	0.0063	0.0472	-.564	.633	No	SIG	SIG
	C	-0.1452	0.1434	0.0055	0.0454	-.330	1.077	No	SIG	SIG
3	M	-0.1957	0.0931	-0.0025	0.0596	-1.090	1.594	No	SIG	SIG
	E	-0.2690	0.1683	-0.0056	0.0805	-.813	1.997	Yes	SIG	SIG
	C	-0.1443	0.1200	0.0009	0.0578	-.416	.470	Yes	INSIG	INSIG
4	M	-0.1850	0.1414	0.0007	0.0498	-.465	1.454	No	SIG	SIG
	E	-0.1438	0.1739	0.0039	0.0566	-.271	.780	No	INSIG	INSIG
	C	-0.1517	0.1317	0.0027	0.0500	-.262	.785	No	INSIG	INSIG
5	M	-0.1957	0.0931	0.0008	0.0456	-1.110	2.322	No	SIG	SIG
	E	-0.2015	0.1358	0.0005	0.0621	-.740	.943	No	SIG	SIG
	C	-0.1558	0.1322	-0.0009	0.0568	-.584	.488	No	SIG	INSIG
6	M	-0.1995	0.1800	0.0013	0.0669	-.533	1.160	No	SIG	SIG
	E	-0.1583	0.1311	0.0036	0.0522	-.796	1.337	No	SIG	SIG
	C	-0.2093	0.1733	0.0043	0.0608	-.646	1.751	No	SIG	SIG
7	M	-0.1850	0.1414	0.0016	0.0513	-.544	1.706	No	SIG	SIG
	E	-0.1363	0.1089	0.0029	0.0486	-.735	.853	No	SIG	INSIG
	C	-0.1789	0.1962	0.0055	0.0571	-.455	1.903	No	SIG	SIG
8	M	-0.1850	0.1414	0.0040	0.0465	-.300	1.232	No	SIG	SIG
	E	-0.1202	0.1263	0.0051	0.0375	-.444	1.351	No	SIG	SIG
	C	-0.1802	0.1549	0.0051	0.0432	-.418	1.846	No	SIG	SIG
9	M	-0.1957	0.0931	0.0048	0.0416	-1.118	2.472	No	SIG	SIG
	E	-0.1639	0.1670	0.0052	0.0495	-.252	.853	Yes	INSIG	SIG
	C	-0.1826	0.1636	0.0035	0.0493	-.363	1.456	No	SIG	SIG
10	M	-0.1850	0.1414	0.0007	0.0498	-.465	1.454	No	SIG	SIG
	E	-0.1646	0.1432	0.0011	0.0563	-.396	.722	No	INSIG	INSIG
	C	-0.1622	0.1178	0.0016	0.0506	-.543	.801	No	SIG	INSIG
11	M	-0.1763	0.1693	0.0041	0.0519	-.392	1.398	No	SIG	SIG
	E	-0.1682	0.1690	0.0043	0.0535	-.229	1.227	No	INSIG	SIG
	C	-0.1591	0.1436	0.0030	0.0474	-.495	1.277	No	SIG	SIG
12	M	-0.1957	0.0931	0.0010	0.0448	-.987	1.977	No	SIG	SIG
	E	-0.1802	0.1357	0.0010	0.0543	-.636	.981	No	SIG	SIG
	C	-0.2878	0.2588	0.0001	0.0930	-.157	1.026	No	INSIG	SIG
13	M	-0.1957	0.0931	0.0038	0.0446	-1.378	3.558	No	SIG	SIG
	E	-0.1195	0.0948	0.0055	0.0369	-.829	1.754	No	SIG	SIG
	C	-0.1110	0.0657	0.0056	0.0345	-.860	.771	No	SIG	INSIG

Pair ID	Type	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S.Test **	K.Test ***
14	M	-0.1957	0.0931	0.0049	0.0438	-1.139	2.324	No	SIG	SIG
	E	-0.1778	0.1321	0.0042	0.0488	-.878	1.727	No	SIG	SIG
	C	-0.1899	0.1462	0.0039	0.0513	-.627	1.655	No	SIG	SIG
15	M	-0.1763	0.1693	0.0026	0.0548	-.315	1.153	No	INSIG	SIG
	E	-0.1551	0.1548	0.0041	0.0591	-.503	.651	No	SIG	INSIG
	C	-0.1565	0.1543	0.0066	0.0555	-.323	.624	Yes	INSIG	INSIG
16	M	-0.1850	0.1414	0.0022	0.0578	-.455	1.359	No	INSIG	SIG
	E	-0.1457	0.1093	0.0008	0.0508	-.731	1.378	No	SIG	SIG
	C	-0.1534	0.1289	0.0048	0.0514	-.398	1.000	Yes	INSIG	INSIG
17	M	-0.1850	0.1414	0.0004	0.0510	-.499	1.448	No	SIG	SIG
	E	-0.1700	0.1777	-0.0006	0.0573	-.429	1.287	No	INSIG	SIG
	C	-0.1439	0.1562	0.0025	0.0521	-.441	.577	No	SIG	INSIG
18	M	-0.1850	0.1414	0.0011	0.0588	-.402	1.213	No	INSIG	SIG
	E	-0.1300	0.1378	0.0014	0.0538	-.295	1.009	No	INSIG	INSIG
	C	-0.1597	0.1548	-0.0023	0.0528	-.516	1.365	No	INSIG	SIG
19	M	-0.1850	0.1414	0.0031	0.0519	-.601	1.816	No	SIG	SIG
	E	-0.1515	0.1233	0.0037	0.0453	-.725	1.914	No	SIG	SIG
	C	-0.1848	0.1871	0.0045	0.0543	-.379	2.481	No	INSIG	SIG
20	M	-0.1850	0.1414	0.0037	0.0467	-.292	1.211	No	INSIG	SIG
	E	-0.1898	0.1798	0.0053	0.0496	-.349	2.149	No	SIG	SIG
	C	-0.1334	0.1563	0.0055	0.0444	-.220	1.118	No	INSIG	SIG
21	M	-0.3975	0.1414	0.0033	0.0525	-1.658	11.836	No	SIG	SIG
	E	-0.2701	0.1548	0.0029	0.0475	-.973	4.999	No	SIG	SIG
	C	-0.3415	0.1563	0.0053	0.0493	-1.255	8.648	No	SIG	SIG
22	M	-0.1850	0.1414	0.0047	0.0505	-.621	2.247	No	SIG	SIG
	E	-0.1715	0.1248	0.0077	0.0500	-.793	2.081	No	SIG	SIG
	C	-0.1735	0.1580	0.0106	0.0530	-.444	2.060	No	INSIG	SIG
23	M	-0.1957	0.0931	-0.0035	0.0541	-1.090	1.981	No	SIG	SIG
	E	-0.1836	0.1971	0.0030	0.0686	-.147	1.573	Yes	INSIG	SIG
	C	-0.1855	0.1082	0.0017	0.0562	-.849	1.358	No	SIG	SIG

* For a normal distribution, the value of the excess kurtosis statistic calculated by SPSS is zero.
** S.Test in SPSS checks to see if the skewness calculated is statistically significant.
*** K.Test in SPSS checks to see if the kurtosis calculated is statistically significant.
SIG = Statistically significant, INSIG = Statistically insignificant, both at the 5% level.
E = Ethical, C = Conventional, M = Market and SD = Standard Deviation.

4.4 Methodology

Marginal Conditional Stochastic Dominance (MCSD) was first proposed by Shalit and Yitzhaki (1994). It is best described in their own words as, "Given a portfolio of risky assets, under what conditions do all risk-averse investors prefer marginally increasing the share of one asset over another?" Thus in our case with respect to the matched pair of ethical and conventional funds using the above we can answer the question: which type of fund is preferred by all risk averse and utility maximizing investors. Clearly the one that dominates the other (according to the MCSD criteria) will be preferred by all investors and hence is the one that has outperformed the other. According to the MCSD theorem developed by Shalit and Yitzhaki (1994), given a portfolio α, asset k dominates asset j for all concave utility functions if and only if:

ACC (k) ≥ ACC (j) with at least one strong inequality

Where:

ACC = Absolute Concentration Curves

More simply speaking, asset k dominates asset j if the ACC of asset k lies above the ACC of asset j. The same paper illustrates with a simple example how to calculate the said ACCs. The MCSD test is implemented as shown below.

In each pair we have 3 assets: 1 ethical fund, 1 conventional fund and 1 benchmark market index. We take the already obtained monthly return series for the 3 assets; we have N = number of monthly observations in each series. We use the market index returns as the wealth index to sort (or rank) the other two fund

returns from lowest to highest. Next, each of the terms in both fund return series (ethical and conventional) is multiplied by 1/N to obtain equally weighted returns. We now take the cumulative sum of this weighted returns series for each fund i.e. each term in the cumulative sum series is the sum of all previous terms of the weighted returns series. For example, the 3rd term of the cumulative return series of fund A is the sum of the 1st and 2nd terms from the weighted return series for fund A. This cumulative return series for fund A is known as the ACC for fund A. Similarly we calculate the ACC for the other fund. Next we compare the two ACCs calculated above at each of the N points. According to the MCSD criteria, a fund dominates the other if its ACC is either equal to or lies above the ACC of the other at all the points, with at least one strong inequality. We repeat the aforementioned procedure for all the 23 pairs of ethical and conventional funds.

We also compare the performance of both type of funds with their respective benchmark market index. In order to do so we need to calculate the ACC of the market using the same procedure as detailed above. The ACC of the market is known by a special name i.e. ALC (Absolute Lorenz Curve). We now compare this ALC, one at a time, with the ACC of the two funds (ethical and conventional) within each of the 23 sets. If the market portfolio is dominated by a fund then increasing the share of that one fund and reducing the proportion of all the other assets (in the market portfolio) improves the portfolio for all risk-averse investors (Shalit and Yitzhaki, 1994). Thus clearly if a fund dominates the market then it has outperformed the market. Results for all tests are shown is Table 4.3.

4.5 Results & Analysis

Looking at Table 4.3 we find that in 3/23 cases the conventional fund dominates the ethical one and in 2/23 cases the ethical fund dominates the conventional one. In rest of the cases there is no dominance. This implies that there is no significant outperformance either ways; this finding is in line with previous studies conducted on the UK market (Mallin et. al. 1995; Gregory et. al. 1997 & 2007; Kreander et. al. 2005).

Next when we look at the performance of the ethical fund versus the benchmark market index, we find that in 11/23 cases the ethical fund dominates the index. A similar picture exists for conventional funds, they dominate the market in 12/23 cases. In rest of the cases there is no dominance either ways. What is further significant is that in none of the cases does the market dominate an ethical or conventional fund. This finding is not in line with previous studies; Mallin et. al. (1995) and Kreander et. al. (2005) both found that on average both the ethical and conventional funds underperform the market.

Table 4.3: Performance Testing – Summary of Results

Pair ID	Type	Sharpe Ratio	MCSD Test (E vs C)	MCSD Test (E vs M)	MCSD Test (C vs M)
1	MARKET (M)	-0.0193			
	ETHICAL (E)	0.0232			
	CONVENTIONAL (C)	0.0201	NO DOM	NO DOM	NO DOM
2	MARKET (M)	0.0018			
	ETHICAL (E)	0.0454			
	CONVENTIONAL (C)	0.0296	**E DOM C**	**E DOM M**	**C DOM M**
3	MARKET (M)	-0.0664			
	ETHICAL (E)	-0.0880			
	CONVENTIONAL (C)	-0.0091	**C DOM E**	NO DOM	**C DOM M**
4	MARKET (M)	-0.0529			
	ETHICAL (E)	0.0100			
	CONVENTIONAL (C)	-0.0125	NO DOM	NO DOM	**C DOM M**
5	MARKET (M)	-0.0499			
	ETHICAL (E)	-0.0419			
	CONVENTIONAL (C)	-0.0707	NO DOM	NO DOM	NO DOM
6	MARKET (M)	-0.0263			
	ETHICAL (E)	0.0102			
	CONVENTIONAL (C)	0.0203	NO DOM	**E DOM M**	NO DOM
7	MARKET (M)	-0.0265			
	ETHICAL (E)	-0.0008			
	CONVENTIONAL (C)	0.0437	NO DOM	**E DOM M**	NO DOM
8	MARKET (M)	-0.0231			
	ETHICAL (E)	0.0005			
	CONVENTIONAL (C)	-0.0001	NO DOM	**E DOM M**	**C DOM M**
9	MARKET (M)	0.0120			
	ETHICAL (E)	0.0183			
	CONVENTIONAL (C)	-0.0157	**E DOM C**	**E DOM M**	NO DOM
10	MARKET (M)	-0.0529			
	ETHICAL (E)	-0.0389			
	CONVENTIONAL (C)	-0.0324	NO DOM	NO DOM	NO DOM
11	MARKET (M)	0.0041			
	ETHICAL (E)	0.0081			
	CONVENTIONAL (C)	-0.0184	NO DOM	**E DOM M**	NO DOM
12	MARKET (M)	-0.0522			
	ETHICAL (E)	-0.0435			
	CONVENTIONAL (C)	-0.0349	NO DOM	NO DOM	NO DOM
13	MARKET (M)	0.0187			
	ETHICAL (E)	0.0671			
	CONVENTIONAL (C)	0.0770	NO DOM	**E DOM M**	**C DOM M**

Pair ID	Type	Sharpe Ratio	MCSD Test (E vs C)	MCSD Test (E vs M)	MCSD Test (C vs M)
14	MARKET (M)	0.0225			
	ETHICAL (E)	0.0056			
	CONVENTIONAL (C)	-0.0001	NO DOM	NO DOM	NO DOM
15	MARKET (M)	-0.0174			
	ETHICAL (E)	0.0103			
	CONVENTIONAL (C)	0.0556	NO DOM	NO DOM	**C DOM M**
16	MARKET (M)	-0.0082			
	ETHICAL (E)	-0.0364			
	CONVENTIONAL (C)	0.0411	NO DOM	NO DOM	**C DOM M**
17	MARKET (M)	-0.0527			
	ETHICAL (E)	-0.0635			
	CONVENTIONAL (C)	-0.0104	**C DOM E**	NO DOM	**C DOM M**
18	MARKET (M)	-0.0249			
	ETHICAL (E)	-0.0216			
	CONVENTIONAL (C)	-0.0929	NO DOM	**E DOM M**	NO DOM
19	MARKET (M)	0.0027			
	ETHICAL (E)	0.0155			
	CONVENTIONAL (C)	0.0284	NO DOM	**E DOM M**	NO DOM
20	MARKET (M)	-0.0267			
	ETHICAL (E)	0.0064			
	CONVENTIONAL (C)	0.0125	NO DOM	**E DOM M**	**C DOM M**
21	MARKET (M)	-0.0371			
	ETHICAL (E)	-0.0504			
	CONVENTIONAL (C)	-0.0003	NO DOM	NO DOM	**C DOM M**
22	MARKET (M)	0.0343			
	ETHICAL (E)	0.0953			
	CONVENTIONAL (C)	0.1453	**C DOM E**	**E DOM M**	**C DOM M**
23	MARKET (M)	-0.1069			
	ETHICAL (E)	0.0104			
	CONVENTIONAL (C)	-0.0101	NO DOM	NO DOM	**C DOM M**

E = Ethical, C = Conventional, M = Market and DOM = Dominance/Dominates.

Theoretically speaking a well diversified market index should not be dominated by a fund but according to our results both ethical and conventional funds convincingly dominate the market. This clearly implies that the fund managers are able to pick winners and hence outperform the market (but not each other). We believe previous studies using a Mean-Variance (MV) approach may have failed to capture this since MV assumes the return distribution to be normal and hence does not account for skewness and kurtosis while evaluating performance. Thus MV clearly ignores pertinent information conveyed by the characteristics of the return distributions, which have a strong bearing on performance, and hence reaches a wrong conclusion. Furthermore, it may also be the case that successful active management produces a more non-normal return distribution, something that MV simply cannot cope with and hence we end up with a wrong conclusion.

Next we look at the issue of fees i.e. does the said dominance of the market by the funds continue after taking into account fees charged by actively managed funds. Mutual funds charge two types of fees: Operational expenses i.e. day to day expenses, depository fees, salaries, bonuses, etc. (these are captured by TER – total expense ratio – annual expenses stated as a percentage of assets under management) and Entry Loads i.e. a onetime fee you pay when you first buy their units. The TER fees are already incorporated into the NAV (Net Asset Value) or closing price that the funds declare on a daily basis and which is provided to us by DataStream. Thus this aspect of fees has already been incorporated into our analysis, therefore we now look at entry loads. Typically entry loads for retail investors are around 5% − Table 4.4 lists the entry loads charged to retail investors by the funds in our study. We spread the cost of the entry load over the

entire data period of the fund as: Monthly load = Entry load/N, where: N = number of months in the data period under consideration. Next we deduct the monthly load from the monthly returns of the fund. Institutional investors, since they invest in bulk, are typically not charged entry loads and hence for them our previous analysis continues to hold as it is.

Another aspect that needs to be looked into is, one cannot invest in the market portfolio in a costless manner. Hence when we compare the after fee performance of funds with the market we are making an unfair comparison, to be fair we must compare the after fee performance of the funds with the after fee performance of the market.

In order to estimate fees for the market we find the least expensive, in terms of TER, index fund within the UK which tracks the given market index. We then spread the cost of this fund i.e. the TER on a monthly basis as: Monthly cost = TER/12. Next we deduct the latter monthly cost from the monthly returns of the market.

Instead of doing the above we could have simply used the return series of the index funds as a proxy for the market but that would then introduce issues of tracking error[1] into the analysis, which we wish to avoid; because if the tracking error is large then the poor performance of the market may be attributed to the inefficient index fund that mimics it rather than the market itself. Secondly, in case of the MSCI world market index we could not find an index fund that mimics the same.

[1] Tracking error is an estimate of how much the returns of an index fund deviate from the returns of the actual market index that the said fund aims to mimic.

Now we have our after fees series ready to be tested, we repeat the entire procedure as detailed earlier i.e. comparing performance using MCSD between ethical and conventional funds as also the said funds versus the market. We find that the results remain unchanged in all but 1 case i.e. Pair ID 18, in this case the ethical fund which previously dominated the market no longer dominates once fees are taken into account. However, even in this case the market does not dominate the fund. In all the other cases dominance is unaffected by fees. This provides further credence to the dominance of the market by the funds.

The fact that these funds convincingly dominate the market implies that the market is inefficient (had the market been efficient, no dominance would have been found) and that the managers of said funds have superior stock picking abilities which allows them to consistently outperform the market. The fact that our data set suffers from survivor bias may have an impact on the same since we have ended up with only surviving i.e. well performing funds. Having said that, we cannot ignore the fact that if investors are able to select the right funds to invest in they can outperform the market.

And finally, each of the 23 pairs have varying data periods ranging from a minimum of 55 months to a maximum of 286 months, this implies that our results are not sample based i.e. outperformance of the market is not limited to a particular period in time.

Table 4.4: Entry loads charged to retail investors by the funds.

Pair ID	Ethical Funds in the UK Fund Name	Entry Load	Pair ID	Matched Conventional UK Funds Fund Name	Entry Load	Benchmark Market Index
1	Aberdeen Responsible UK Equity	4.25	1	Aberdeen UK Equity	4.25	FTSE all share
2	AEGON Ethical Equity	5.5	2	AEGON UK Equity	5.5	FTSE all share
3	Allianz RCM Global Eco Trends	4	3	Allianz RCM Dynamic Growth	4	MSCI World
4	Aviva Investors UK Ethical	5	4	Aviva Investors UK Growth	5	FTSE all share
5	Aviva Investors Sustainable Future Absolute Growth	4	5	Aviva Investors World Leaders	5.25	MSCI World
6	Aviva Investors Sustainable Future European Growth	4	6	Aviva Investors European Equity	5	FTSE W. EU ex UK
7	Aviva Investors Sustainable UK Growth	4	7	Aviva Investors UK Focus	5	FTSE all share
8	F&C Stewardship Growth	5	8	F&C UK Equity Growth	5	FTSE all share
9	F&C Stewardship International	5	9	F&C Global Growth	5	MSCI World
10	Family Charities Ethical	0	10	Family Asset Trust	5	FTSE all share
11	Halifax Ethical - Managed by Scottish Widows	5	11	Scottish Widows Global Growth	5	FTSE World
12	Henderson Global Care Growth	4.5	12	Henderson Global Innovation	4.25	MSCI World
13	Henderson Global Care Managed	4.5	13	Henderson Multi Manager Managed	5	MSCI World
14	Henderson Industries of the Future	5	14	Henderson International	5	MSCI World
15	Jupiter Ecology	5	15	Jupiter Global Managed	5.25	FTSE World
16	Jupiter Environmental Income	5.25	16	Jupiter Growth & Income	5.25	FTSE all share
17	Legal & General Ethical	0	17	Legal & General Growth	5	FTSE all share
18	Marlborough Ethical	5.25	18	Marlborough UK Equity Income	5	FTSE all share
19	Premier Ethical	4.25	19	Premier UK Strategic Growth	4.25	FTSE all share
20	Scottish Widows Environmental Investor	5	20	Scottish Widows UK Select Growth	5	FTSE all share
21	Scottish Widows Ethical	5	21	Scottish Widows UK Select Growth	5	FTSE all share
22	Standard Life UK Ethical	4	22	Standard Life UK Opportunities	4	FTSE all share
23	St. James Place Ethical	5	23	St. James Place Global	5	MSCI World

Table 4.5 shows the list of index funds whose TER is used to estimate costs for holding the market portfolio.

Market Index	Tracker Fund	TER (%)	Entry Load
FTSE all share	L&G UK Index	0.56	0
MSCI world	L&G Global*	1.15	0
FTSE World EU ex UK	L&G EU Index	0.84	0
FTSE World	Aviva International	0.96	0

* Since we could not find an Index fund that tracks the MSCI world we used the L&G Global which tracks the S&P 100 Global Index

4.6 Conclusion

We compare the performance of UK ethical funds with similar conventional ones; in order to control for confounding variables the two funds are closely matched across the parameters of size, age, investment universe and fund management company. The last factor is a new one introduced by us since we believe it is likely to have a significant impact on performance; it also gives us closer matches.

All previous studies on the performance of ethical funds have used a Mean-Variance (MV) and/or model based approach to compare performance. This is the first study to use a Marginal Conditional Stochastic Dominance (MCSD) approach. We find that the MV approach is weakened by the returns not being normally distributed as also the restrictive assumption that the investor utility

function has to be quadratic when several studies have in fact shown that investors prefer positive skewness and avoid excess kurtosis (Kraus et. al., 1976; Athayde et. al., 1997; Dittmar, 2002; Post et. al., 2003). Secondly, the MCSD approach is more thorough since it compares the performance of the two assets over the entire range of their return distributions as opposed to limiting the comparison to the first two moments, namely, mean and variance of the distribution. And finally, an MCSD approach is free from the need to correctly specify asset pricing models.

We find that there is no significant difference in the performance of ethical and conventional funds, this is in line with the findings from previous studies. However, we also find strong evidence that on average both ethical and conventional funds out perform their benchmark market portfolios, both before and after fees. We feel, previous studies may have failed to capture this due to the poor Mean-Variance methodology used by them.

Chapter 5 – Passive: Evidence from the FTSE4Good Index Series

5.1 Introduction

As discussed in Chapter 4 ethically managed funds account for roughly eleven per cent of all assets under management with mutual funds in the US (SIF, 2008) and twenty two per cent of all assets under management in the UK (UKSIF, 2008). Such widespread prominence puts ethical fund management in a position where it can no longer be neglected.

Equity investors can be broadly defined as two types: active and passive. Passive investors are those who believe in the efficient market hypothesis (Fama, 1970) and hence don't try to outperform the market but instead invest in the market portfolio either through an exchange traded fund or an index fund i.e. a mutual fund that tracks the index. Active investors on the other hand are those who believe it is possible to outperform the market and hence "actively" seek out investments that they think will be able to beat the market.

When passive yet ethical investors look to invest their money they would quite naturally seek out ethical indices. Hence it is greatly beneficial to compare the

performance of ethical indices with conventional ones. Thus the question we seek to answer is: do ethical passive investors out/under perform conventional passive investors? Theoretically speaking, since ethical investors face a smaller or more restricted investment universe than conventional investors, the latter should be able to outperform the former. Working with indices has a distinct advantage, indices are immune to biases introduced into the said comparison by fund specific characteristics that affect individual mutual funds: operating costs, management style, size, age, etc.

The FTSE4Good index series (the ethical index series) used in this study was launched in July 2001. The FTSE (2011) website states: "The FTSE4Good Index Series has been designed to objectively measure the performance of companies that meet globally recognised corporate responsibility standards." The FTSE4Good covers four geographical regions: US, UK, Europe and Global. It has a set of two indices for each region: a benchmark index and a tradeable index. The benchmark index consists of all companies from the respective regional investment universe that meet the FTSE4Good ethical criteria. The tradeable index is much smaller in size, consisting of either 50 or 100 firms selected from the respective benchmark index. They form a representative sample that mimics the performance of the benchmark index. Secondly, the smaller tradeable index is easier for investors to replicate in their own portfolio as opposed to replicating the benchmark.

The FTSE4Good advisory committee decides whether a company is ethical enough to be included in the index series or not. Broadly speaking they look at the following issues: corporate social responsibility, non-discriminatory labour

policies, fair stakeholder practices, environmental sustainability and transparent management. The committee carries out a review twice every year to ensure that all FTSE4Good index constituents continue to meet their criteria. In case they don't then those firms are dropped while new ones are added to the indices.

5.2 Literature Review

There are very few published studies on the performance of ethical indices; one of the first studies were by Sauer (1997) and Statman (2000); both studies compared the performance of the Domini Social Index (an ethically screened version of the conventional S&P 500) with the S&P 500. They used Sharpe ratio and the CAPM to estimate Jensen's alpha for the said comparison; they found no significant difference in the performance of the two indices.

Statman (2006) extended his earlier study, he chose to compare the performance of four popular ethical indices with the S&P500 index. The four ethical indices he used were: Domini Social Index, Calvert's Social Index, Citizen's Index and Dow Jones Sustainability US Index. Thus this study is an improvement over the previous one in the sense that it compares three more ethical indices with the S&P 500 as also has a larger time horizon extending up to 2004. Also, in this study he used the Fama-French three factor model to estimate alpha as opposed to the more simpler CAPM in the previous one. However, all four indices are constituted of US equities – thus this study as well as the previous one was limited to US equity indices. He found that the returns of the ethical indices exceeded the returns of the

S&P500 however the results were not statistically significant thus leading to the conclusion, "We cannot reject the hypothesis that returns of socially responsible companies are equal to those of conventional companies" (Statman, 2006, p. 108).

Schroder (2007) was the first extensive study on this topic, he studied the performance of 29 ethical indices worldwide. He used a CAPM model to estimate alpha; he argued against the need for a multi factor model like the Fama-French 3 factor model (1993) or the Carhart 4 factor model (1997); he provided three arguments for the same: "Firstly, the SRI indices do not officially follow specific investment styles. Secondly, the indices are only adjusted infrequently, in most cases only once or twice a year. And thirdly, almost all of the SRI indices are closely related to a single conventional benchmark index" (Schroder, 2007, p. 335). He presented the high adjusted R-square values (greater than 90%) of the CAPM regression (the ethical index being the dependent variable and the relevant benchmark market index being the independent variable) to show that the model had been correctly specified. When he compared the performance of the ethical indices with their relevant benchmark market portfolio, he found no significant evidence of under/out performance.

Collison et. al. (2008) was the first study to look exclusively at the performance of the FTSE4Good ethical index series. The period of their study extends from 1996 – 2005. Although the FTSE4Good indices were launched in July 2001, FTSE4Good provided the authors with simulated historical data from 1996 for promotional purposes. Schroder (2007) has done this too with respect to the FTSE4Good indices used in his study i.e. he too has used simulated data starting from 1996 as opposed to 2001 when the FTSE4Good indices were actually

launched. This is counter-intuitive; passive (index) investors choose to either mimic the index themselves or invest in an index fund that does so for them. How can such an investor possibly invest in an index that does not exist. Fortunately Collison et. al. (2008), but not Schroder (2007), separately compare performance for a time period that is post the launch of the index series i.e. from July 2001upto 2005. In fact what they found is, for the overall period from 1996 – 2005 the ethical indices outperformed the respective market indices while for a period post the actual launch of the series, the ethical indices underperformed the market indices.

In their own words, "Once the indices went 'live', their returns were on average negative, riskier and lower than those achieved by their base universe indices" (Collison et. al., 2008, p.27). However later they surprisingly conclude by saying, "The performance of the indices suggests that the adoption of an SRI strategy need not be at the expense of returns for investors. Once risk is included in the analysis, the FTSE4Good indices achieve the same level of return as their base universe indices, despite restricting their attention to socially responsible firms" (Collison et. al., 2008, p.27).

It's important to note a few things about previous studies and how our study contributes to the current literature. All previous studies use Mean Variance analysis (MV) and/or asset pricing models for comparing the performance of the indices; more specifically, they use Sharpe ratio and alpha (either Jensen's alpha which is estimated using CAPM or the alpha from the 3 factor Fama and French model) as indicators of performance. Our study is the first to use Marginal Conditional Stochastic Dominance (MCSD) to compare performance. Although

the hypothesis of performance is the same i.e. we too are checking to see if ethical indices out/under perform conventional ones, we believe MCSD is a better method for comparing performance than mean variance analysis for the following reasons.

Mean variance analysis hold under the following conditions: the return are normally distributed and/or the investor utility function is quadratic (Baron, 1977; Collins and Gbur, 1991; Johnstone and Lindley, 2010; Markowitz, 1959; Mossin, 1973). Both these assumptions are restrictive. Returns may not be normally distributed. This can be tested using statistical tests but none of the previous studies talk about this. They do not state whether tests were conducted to check the return distributions for normality.

The second assumption, investor utility function is quadratic, is especially restrictive since there may be a number of investors who have a concave utility function but one that is not quadratic. In fact past studies have shown that investors show a preference for positive skewness and an aversion to kurtosis (Kraus et. al., 1976; Athayde et. al., 1997; Dittmar, 2002; Post et. al., 2003). This cannot be incorporated into a quadratic utility function since its third derivative is zero and its fourth derivative is undefined. More generally speaking, we can never know the exact utility function for all investors, thus we make some assumptions. MCSD makes weaker assumptions i.e. it only assumes that the investor utility function is non-decreasing (axiom of monotonicity) and that investors are risk averse. Thus giving us a concave utility function and yet allowing for the utility function to incorporate the investor attitudes towards skewness and kurtosis. Thus performance evaluation using MCSD would hold for a much larger set of utility

functions and hence for a greater number of investors than MV. In other words, the set of utility functions under which MV holds is a subset of the set of utility functions under which MCSD holds.

Even if the above conditions are met, MCSD is still superior to MV since it considers the entire range of the distributions while comparing the two indices as opposed to only comparing the first two moments, namely, mean and variance. Having said that, MV has been preferred over the years since it's computationally less intensive and also since it makes for a generalised comparison i.e. one could calculate the means and variances of several indices and then simply compare them with each other, while on the other hand using an MCSD approach entails pair wise comparisons. Even though that has been the advantage of MV, we feel it's not relevant in the present circumstances; while comparing indices the pair wise comparisons are pretty limited given the small number of ethical indices in existence as also the number of indices that have been used in previous studies as well as this one.

And finally, the MCSD approach is free from the need to correctly specify asset pricing models, for example CAPM, Fama-French 3 factor model, etc. which are used to estimate alpha which is then used as an indicator of performance.

Having said that, the limitation of MCSD is that in certain cases it can produce inconclusive results. For example, when we compare two indices say index A and index B, it is likely that an MCSD comparison may give us the following inconclusive result: neither index dominates or outperforms the other. However, we feel it is better to not reach a conclusion than reach a wrong one as may be the

case when studies are restricted to MV analysis without accounting for pertinent issues like investor attitudes towards skewness & kurtosis and non-normality of the return distributions.

This is only the third study on the performance of the FTSE4Good index series; Schroder (2007) used monthly returns for his study, Collison et. al. (2008) used daily return while we use weekly returns. The previous two studies stop at 2005 where as our data period extends upto November 2010.

5.3 Data Set

We use the FTSE4Good Series of ethical indices in this study. Instead of comparing the performance of the said series with their relevant benchmarks we compare their performance with a similar conventional index and instead use the relevant benchmarks to represent the parent market portfolio. This is an approach used by Sauer (1997) as also by Statman (2000, 2006). On the other hand, Schroder (2007) and Collison et. al. (2008) compare the performance of the ethical index with the relevant market/benchmark index. We believe the former makes for a reasonable comparison while the latter is unfair since it's comparing two indices one of which is hugely well diversified than the other, hence violating the canon of likewise comparisons. For example, the latter approach compares the performance of the FTSE4Good-UK-50 which is an ethical index comprised of 50 stocks with that of the FTSE-Allshare which is composed of almost all listed stocks in the UK i.e. more than 4000 stocks. We believe it would make for a fairer

comparison if one were to use the FTSE-Allshare to represent the market index/portfolio (which in the MCSD methodology is used as a wealth index for ranking outcomes) while comparing the performance of the ethical FTSE4Good-UK-50 with the conventional FTSE-100 (which is comprised of 100 UK stocks).

All the indices that were used in this study have been listed in Table 5.1. Since we will be making pair wise comparisons the indices are grouped together with each group consisting of one market index, one ethical index and one conventional index. We have 9 such groups and in all 19 individual indices. The market index is used as a benchmark in the MV approach and for ranking wealth outcomes in the MCSD approach, for both the ethical and conventional indices. In the next section, we discuss in greater detail both MV and MCSD methods used.

We collect weekly data from DataStream for all the indices. We also collect weekly data for the risk-free rates in the currency that matches the currency of the indices in each of the 9 groups. Within each group we ensure that weekly values for all the 3 indices included are collected in the same currency. The study period starts from July 2001 i.e. when the FTSE4Good index series was launched and ends at November 2010. This gives us almost 10 years of weekly data amounting to 488 observations. We then calculate weekly arithmetic returns for each index using the following formula.

$$R_{i,t} = (P_{i,t} / P_{i,t-1}) - 1$$

Where:

$R_{i,t}$ = Return for index i in week t

$P_{i,t}$ = Closing value for index i in week t

$P_{i,t-1}$ = Closing value for index i in week t-1

Table 5.2 shows descriptive statistics of the weekly arithmetic return series for all the indices included in this study. Looking at the raw mean returns in Table 5.2, we find that the FTSE4Good indices underperform their conventional counterparts in all the 9 cases; in 7 out of those 9 cases (excepting for FTSE4Good Europe) the FTSE4Good indices have higher risk as estimated using Standard Deviation (SD). Thus looking at the raw data it appears that the FTSE4Good indices underperform their conventional counterparts.

All the indices studied have negative skewness and positive kurtosis that are significant at the 5% level. It has been well documented that investors do not prefer negative skewness and the presence of kurtosis; however, MV analysis does not take investor attitudes towards skewness and kurtosis into account. We also perform the Shapiro-Wilk test on the return series of all the indices and we find that none of the returns are normally distributed. This provides further evidence that MV analysis is ill-suited for this data set. It has been argued that stock returns data is more likely to be log-normally distributed than normally distributed since stock prices cannot be negative, hence we also test to see if the data is log-normally distributed using the Shapiro-Wilk test. We find similar results in this case too. We list here the results for the arithmetic returns series since that is the one used in our study.

Table 5.1 – Indices used in this study

Index Type	Index Names	Country	Currency
ETHICAL (E)	FTSE4GOOD-UK-50	UK	£
CONVENTIONAL (C)	FTSE-100	UK	£
MARKET (M)	FTSE-ALL SHARE	UK	£
ETHICAL (E)	FTSE4GOOD-UK-BENCH	UK	£
CONVENTIONAL (C)	FTSE-ALL SHARE	UK	£
MARKET (M)	FTSE-ALL WORLD	GLOBAL	£
ETHICAL (E)	FTSE4GOOD-US-100	US	$
CONVENTIONAL (C)	SP-100	US	$
MARKET (M)	DJ-TSMI-US	US	$
ETHICAL (E)	FTSE4GOOD-US-100	US	$
CONVENTIONAL (C)	SP-500	US	$
MARKET (M)	DJ-TSMI-US	US	$
ETHICAL (E)	FTSE4GOOD-US-100	US	$
CONVENTIONAL (C)	DOW JONES - 30	US	$
MARKET (M)	DJ-TSMI-US	US	$
ETHICAL (E)	FTSE4GOOD-US-BENCH	US	$
CONVENTIONAL (C)	DJ-TSMI-US	US	$
MARKET (M)	FTSE-ALL WORLD	GLOBAL	$
ETHICAL (E)	FTSE4GOOD-EU-50	EU	€
CONVENTIONAL (C)	STOXX-50	EU	€
MARKET (M)	STOXX-TM	EU	€
ETHICAL (E)	FTSE4GOOD-EU-BENCH	EU	€
CONVENTIONAL (C)	STOXX-TM	EU	€
MARKET (M)	FTSE-ALL WORLD	GLOBAL	€
ETHICAL (E)	FTSE4GOOD-GLOBAL-100	GLOBAL	$
CONVENTIONAL (C)	SP-GLOBAL-100	GLOBAL	$
MARKET (M)	FTSE-ALL WORLD	GLOBAL	$

Table 5.1 shows the indices used in this study. Since we make pair wise comparisons the indices have been grouped as follows: 1 ethical index, 1 conventional index and 1 market index. Ethical indices are of two types: either a benchmark index (as signified by the letters "BENCH" at the end of their name) or a tradeable index (as signified by a number, either 50 or 100 at the end of their name). The FTSE-All-World index is used in four sets of comparisons as the market index; in each case we use a format of the same in a currency that is matching to that of the other two indices. DataStream provides index values for the FTSE-All-World index in £, $ and €.

This is the third study on the performance of FTSE4Good index series; neither of the previous two studies have discussed the issue of normality nor presented any tests to show that the returns are normally distributed. They have either assumed that the returns are normally distributed or have proceeded under the assumption that the returns being non-normally distributed has no bearing on the results. This, in our view, is a huge oversight.

We also find that for all the indices the mean returns are either negative or very close to zero. Thus for the time period under consideration in this study, it seems index investing has not produced good results for investors, whether ethical or conventional. However, the raw data does tell us that ethical investors have been worse off than conventional ones on both the counts of return and risk.

5.4 Methodology

First we perform MV analysis as done by all previous studies. We calculate the Sharpe Ratios using the following formula. The Sharpe Ratio (Sharpe, 1966) is defined as the excess return of a portfolio (calculated as the mean return minus the risk free rate) per unit of risk which is measured as the standard deviation of the return. Results are shown is Table 5.3.

Sharpe Ratio = $\frac{r_i - r_f}{\sigma_i}$

Where:

r_i = mean of weekly index return series

r_f = risk free rate for the given period in the respective currency

σ_i = standard deviation of the weekly index return series

Standard deviation is a measure of the dispersion of the weekly returns from the mean of the return series. The more spread apart the returns, the higher will be the standard deviation. It is calculated using the formula below:

$$\sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

Where:

N = number of observations; x_i = return of the index in week i

$\bar{x}$ = mean of the weekly index return series

Next we use a model based approach to explain returns. In this case, since we are dealing with indices, we feel that the market may be able to explain a very high proportion of the index returns. We perform the CAPM regression to estimate Jensen's alpha. All previous studies have used the CAPM model to estimate alpha. Only Statman (2006) used the Fama-French 3 factor model, but as pointed out by Schroder (2007), we too find high adjusted R-squares (all greater than 90%) for the alpha regressions using CAPM, which means the model has been well specified and thus find no statistical justification to use a multi-factor model to estimate alpha.

Table 5.2: Descriptive statistics of the Indices

Type	Index Name	Min	Max	Mean	SD	Skew	Kurtosis
E	FTSE4GOOD-UK-50	-0.12978	0.16798	-0.00015	0.02709	-0.23246	6.24343
C	FTSE-100	-0.12532	0.16689	0.00000	0.02665	-0.25559	5.96409
M	FTSE-ALL SHARE	-0.11853	0.16581	0.00015	0.02602	-0.25487	5.76553
E	FTSE4GOOD-UK-BENCH	-0.12056	0.16564	-0.00015	0.02648	-0.22628	5.85838
C	FTSE-ALL SHARE	-0.11853	0.16581	0.00015	0.02602	-0.25487	5.76553
M	FTSE-ALL WORLD (£)	-0.11861	0.10009	0.00027	0.02494	-0.34481	2.71261
E	FTSE4GOOD-US-100	-0.15863	0.11603	-0.00039	0.02709	-0.62937	5.35700
C	SP-100	-0.13991	0.13236	-0.00033	0.02599	-0.44257	5.01291
M	DJ-TSMI-US	-0.16620	0.11907	0.00022	0.02663	-0.72910	5.45943
E	FTSE4GOOD-US-100	-0.15863	0.11603	-0.00039	0.02709	-0.62937	5.35700
C	SP-500	-0.15766	0.12375	-0.00005	0.02634	-0.66029	5.45236
M	DJ-TSMI-US	-0.16620	0.11907	0.00022	0.02663	-0.72910	5.45943
E	FTSE4GOOD-US-100	-0.15863	0.11603	-0.00039	0.02709	-0.62937	5.35700
C	DOW JONES - 30	-0.13852	0.11950	0.00009	0.02479	-0.47110	4.54216
M	DJ-TSMI-US	-0.16620	0.11907	0.00022	0.02663	-0.72910	5.45943
E	FTSE4GOOD-US-BENCH	-0.15908	0.11491	-0.00027	0.02729	-0.63201	5.21249
C	DJ-TSMI-US	-0.16620	0.11907	0.00022	0.02663	-0.72910	5.45943
M	FTSE-ALL WORLD ($)	-0.13127	0.13044	0.00045	0.02674	-0.46875	3.37907
E	FTSE4GOOD-EU-50	-0.15164	0.13536	-0.00110	0.03027	-0.46256	4.68550
C	STOXX-50	-0.14877	0.14565	-0.00089	0.03340	-0.44893	3.45514
M	STOXX-TM	-0.14273	0.16196	-0.00055	0.03152	-0.38910	3.60632
E	FTSE4GOOD-EU-BENCH	-0.14739	0.14655	-0.00070	0.02985	-0.39051	4.37178
C	STOXX-TM	-0.14273	0.16196	-0.00055	0.03152	-0.38910	3.60632
M	FTSE-ALL WORLD (€)	-0.10174	0.10067	-0.00036	0.02561	-0.19005	2.09976
E	FTSE4GOOD-GLOBAL-100	-0.11813	0.11368	-0.00044	0.02775	-0.33170	2.97959
C	SP-GLOBAL-100	-0.10980	0.11253	-0.00014	0.02665	-0.27752	2.77667
M	FTSE-ALL WORLD ($)	-0.13127	0.13044	0.00045	0.02674	-0.46875	3.37907

Table 5.2 shows the key descriptive statistics of the index return series. All the skewness and excess kurtosis values are significant at the 5% level. We also performed the Shapiro-Wilk test for normality on each of the index return series and found that none of the return series were normally distributed. E = Ethical, C = Conventional, M = Market and SD = Standard Deviation.

The CAPM regression equation used is shown below.

$r_{it} - r_{ft} = \alpha_i + \beta_i (r_{mt} - r_{ft}) + \varepsilon_{it}$

Where:

r_{it} = return of index at times t; r_{ft} = risk free rate at time t

α_i = Excess return or Jensen's alpha; β_i = Beta for the index

r_{mt} = return of the market at time t; ε_{it} = random error term at time t

The Jensen's alpha (Jensen, 1968) is used to calculate the excess return of a portfolio. Simplistically speaking this is the alpha term in the CAPM regression. If this alpha is positive then the fund is said to outperform the market portfolio and vice versa. We test the alphas to see if they are statistically significant using the t-test; we use the White and Newey-West standard errors which are robust to the ill effects of heteroskedasticity and serial correlation for calculating the p-value for the t-tests. We find that alphas are significant in 2 out of the 9 cases. Results are shown is Table 5.3.

Next we compute the Treynor Ratios using the following formula. The CAPM regression performed earlier also supplies us with the estimates of Beta for each index; this is used in the calculation of the Treynor Ratios.

Treynor Ratio = $\frac{r_i - r_f}{\beta_i}$

Where:

r_i = mean of the weekly index return series

r_f = risk free rate for the given period in the respective currency

β_i = Beta of the index relative to the market portfolio

Treynor Ratio (Treynor, 1965) is similar to the Sharpe Ratio, it calculates the excess return of a portfolio (calculated as the mean return minus the risk free rate) per unit of risk which is measured as the Beta of the portfolio. It has been argued that the Treynor Ratio provides a better estimate of performance since it only takes into account risk that cannot be diversified away. Results are in Table 5.3.

Next we proceed to test performance using the MCSD approach. Marginal Conditional Stochastic Dominance (MCSD) was first proposed by Shalit and Yitzhaki (1994). It is best described in their own words as, "Given a portfolio of risky assets, under what conditions do all risk-averse investors prefer marginally increasing the share of one asset over another?" Thus in the case of a two asset portfolio, in our case the matched pair of ethical and conventional indices, using the above we can answer the question: which type of index is preferred by all risk averse utility maximizing investors. Clearly the one that dominates the other according to the MCSD criteria will be preferred by investors and hence is the one that has outperformed the other.

According to the MCSD theorem developed by Shalit and Yitzhaki (1994), given a portfolio α, asset k dominates asset j for all concave utility functions if and only if:

$ACC(k) \geq ACC(j)$ with at least one strong inequality

Where:

ACC = Absolute Concentration Curves

More simply speaking, asset k dominates asset j if the ACC of asset k lies above the ACC of asset j. The same paper illustrates with a simple example how to calculate the said ACCs. The MCSD test is implemented as shown below.

In each set we have 3 indices: 1 ethical, 1 conventional and 1 market. We take the already obtained weekly returns for the 3 indices; we have N = 487 returns in each series. We use the market index returns as the wealth index to sort (or rank) the other two index returns from lowest to highest. Next, each of the terms in the two index returns series (ethical and conventional) is multiplied by 1/N to obtain equally weighted returns. Each observation is given an equal weight of 1/N since it has an equal probability of occurring. We now take the cumulative sum of this weighted returns series for each index i.e. each term in the cumulative sum series is the sum of all previous terms of the weighted returns series. For example, the 3^{rd} term of the cumulative return series of index A is the sum of the 1^{st} and 2^{nd} terms from the weighted return series for index A. This cumulative return series for index A is known as the ACC for index A. Similarly we calculate the ACC for the other index. Next we compare the two ACCs calculated above at each of the 487 points. According to the MCSD criteria, a index dominates the other if its ACC is either equal to or lies above the ACC of the other at all the points. We repeat the aforementioned procedure for all the 9 cases or sets of indices.

5.5 Results & Analysis

Table 5.3 lists the results of both MV and MCSD testing. Looking at Table 5.3 we find that all the Sharpe and Treynor Ratios are negative. Negative values of those ratios render them meaningless. Here's why: both Sharpe and Treynor Ratios calculate the excess return over the risk free rate per unit of risk; now, say we have two investments both with identical & positive excess returns with differing values for risk; the investment which has higher risk will give us a smaller value of the Sharpe/Treynor Ratio and thus that investment can be said to underperform the other one. But when we have negative excess returns, a higher level of risk produces a smaller negative number; hence given identical & negative excess returns, the investment with higher risk comes out on top. This is antithetical to the concept of performance. As pointed out earlier, the Jensen alphas are significant only in 2 out of the 9 cases. Thus the end result using MV & model based analysis is: comparison of performance between ethical and conventional indices produces conclusive results only in 2 out of the 9 cases; in 7 out of the 9 cases we cannot conclude anything; the two conclusive results being: according to the Jensen's alpha measure, the conventional S&P-100 and S&P500 indices outperform the FTSE4Good-US-100 ethical index.

These results are in line with what was found in the Collison et. al. (2008) study for the post July 2001 period. They too found all negative Sharpe and Treynor ratios and insignificant Jensen alphas. However, they did not talk about how negative values of those ratios renders the comparison of performance between two assets (in this case indices) meaningless. Instead they continue to compare the

performance of indices using the negative Sharpe and Treynor ratios as if it were business as usual. In their own words, "Indeed, all of the indices had negative Sharpe ratios in the years 2001–2005 but those of the FTSE4Good indices were worse than the markets from which the securities were drawn. The results for the Treynor measures are similar to the findings for the Sharpe ratios" (p.26). This is a great oversight. Schroder (2007) on the other hand did not separately analyse the data for the post July 2001 period.

Using the MCSD approach we find conclusive results in 4 out of the 9 cases. We find that the FTSE4Good-US-100 ethical index is dominated by the similar conventional S&P 100 index – MCSD dominance implies outperformance. The FTSE4Good-US-100 is also found to be dominated by two other conventional indices: the more well diversified S&P-500 as also the less diversified DJIA-30. We also find that the FTSE4Good-Global-100 ethical index is dominated by the conventional S&P-Global-100 index. In rest 5 of the 9 cases we did not find any dominance either way.

As pointed out earlier, another weakness of MCSD is that it may at times produce inconclusive results. However, in this study, using MV produced results that were more inconclusive than MCSD.

Overall we find that conventional indices did better than the ethical indices in the US and Global context. In the UK and European context both conventional and ethical indices performed equally.

Table 5.3: Performance Testing – Summary of Results

Type	Index Name	Sharpe Ratio	Treynor Ratio	Jensen's Alpha	MCSD Dominance
E	FTSE4GOOD-UK-50	-0.032	-0.0008	-0.0003	No Dominance
C	FTSE-100	-0.027	-0.0007	-0.0001	
M	FTSE-ALL SHARE	-0.022	-0.0006	NA	
E	FTSE4GOOD-UK-BENCH	-0.033	-0.0010	-0.0005	No Dominance
C	FTSE-ALL SHARE	-0.022	-0.0006	-0.0002	
M	FTSE-ALL WORLD (£)	-0.018	-0.0004	NA	
E	FTSE4GOOD-US-100	-0.030	-0.00083	-0.00061*	Conventional Dominates Ethical
C	SP-100	-0.029	-0.00079	-0.00056*	
M	DJ-TSMI-US	-0.008	-0.0002	NA	
E	FTSE4GOOD-US-100	-0.030	-0.0008	-0.0006*	Conventional Dominates Ethical
C	SP-500	-0.018	-0.0005	-0.0003*	
M	DJ-TSMI-US	-0.008	-0.0002	NA	
E	FTSE4GOOD-US-100	-0.030	-0.0008	-0.0006*	Conventional Dominates Ethical
C	DOW JONES - 30	-0.014	-0.0004	-0.0001	
M	DJ-TSMI-US	-0.008	-0.0002	NA	
E	FTSE4GOOD-US-BENCH	-0.026	-0.0008	-0.0007	No Dominance
C	DJ-TSMI-US	-0.008	-0.0002	-0.0002	
M	FTSE-ALL WORLD ($)	0.001	0.00003	NA	
E	FTSE4GOOD-EU-50	-0.052	-0.0017	-0.0006	No Dominance
C	STOXX-50	-0.041	-0.0013	-0.0003	
M	STOXX-TM	-0.033	-0.0009	NA	
E	FTSE4GOOD-EU-BENCH	-0.040	-0.0011	-0.0003	No Dominance
C	STOXX-TM	-0.033	-0.0009	-0.0001	
M	FTSE-ALL WORLD (€)	-0.034	-0.0008	NA	
E	FTSE4GOOD-GLOBAL-100	-0.031	-0.0009	-0.0009*	Conventional Dominates Ethical
C	SP-GLOBAL-100	-0.021	-0.0006	-0.0006	
M	FTSE-ALL WORLD ($)	0.001	0.0000	NA	

Table 5.3 shows summary of results of all the tests carried out to evaluate performance. * Indicates significance at the 5% level. E = Ethical, C = Conventional and M = Market.

We believe that previous two studies on the performance of FTSE4Good series did not find any significant underperformance because they used simulated data starting from 1996 while the index series was actually launched in July 2001. And as has been found by Collison et. al. (2008), the FTSE4Good indices outperform their benchmarks in the time period previous to their launch in July 2001 i.e. from 1996 to July 2001 while post July 2001 they underperform their benchmarks. In their own words: "Once the indices became available for usage by fund managers and other investors, their performances deteriorated relative to the performances of their base universes. Thus researchers need to be careful when studying the data for these indices; if the pre-July 2001 information is included, incorrect inferences about the performances of FTSE4Good indices may be drawn" (p. 27).

5.6 Conclusion

In this study we compare the performance of the FTSE4Good Series of ethical indices that were launched in July 2001 with that of similar conventional indices. This is the first study to do so; previous two studies on the FTSE4Good index series (Schroder, 2007; Collison et. al., 2008) compare their performance with the market benchmark but do not compare them with similar conventional indices. We believe the latter makes for a fairer and more intuitive comparison. Our belief is supported by previous US studies that compare the performance of the ethical Domini 400 Social Index with the conventional S&P 500 (Sauer, 1997; Statman 2000).

In all we study 19 indices over a period of almost 10 years since the launch of the FTSE4Good index series in July 2001. First we perform MV & model based analysis, we find that it produces largely inconclusive results; the Sharpe and Treynor ratios are all negative and thus meaningless while almost all the Jensen alphas are insignificant. However the adjusted R-squares are all greater than 90% thus implying that the issue does not lie with model specification. The MV methodology is further weakened by the fact that none of the index return series are normally distributed.

Next we use the MCSD methodology; we find more conclusive results. The FTSE4Good-US-100 ethical index when compared with a similar conventional index the S&P 100, is found to be dominated by the S&P-100. The said ethical index is also found to be dominated by the more well diversified S&P-500 as also the less diversified DJIA-30. We also find that the ethical FTSE4Good-Global-100 index is dominated by the conventional S&P-Global-100 index. Thus in the US and Global context an ethical index investor has to pay a price for being ethical; in the UK and EU context the ethical index investor pays no such price.

Chapter 6 – Criteria: Performance and Criteria

6.1 Introduction

As we know from Section 2.5 (chapter 2 sub-section 5, pp. 34 – 41) of this thesis, ethical funds operate under various criterion. Some use negative screening i.e. do not invest in companies that operate in certain business areas which are deemed unethical by the fund and thus its investors. Examples of negative screening are avoiding companies that are related to tobacco, gambling, alcohol, etc. Ethical funds also use positive screening or preference i.e. choose to invest in companies with certain practices deemed 'good' by the fund and consequentially its investors. Examples of positive screening are actively seeking to invest in companies which put greater emphasis on corporate social responsibility (CSR), above average corporate governance practices, clean environmental practices, etc. Other ethical funds may not apply screens but actively engage with the companies towards achieving higher ethical standards, better labour relations, etc. Some ethical funds may apply all of the aforementioned ethical strategies.

In this chapter we test to see if funds operating under certain ethical criterion tend to outperform other ethical funds. We also look at the issues of geographical investment universe, compare performance between funds investing locally (i.e.

only in UK firms) versus funds investing globally, and type of ethical research employed i.e. compare performance between funds using only internal ethical research while making investment decisions versus funds that use both internal & external ethical research services.

This is only the third study to address these questions. One previous study used a Mean-Variance (MV) approach while the other used a model based approach. This is the first study to apply the more robust Marginal Conditional Stochastic Dominance (MCSD) methodology. For a detailed discussion on advantages & drawbacks of using an MCSD approach look at Chapter 3 sub-section 6, pp. 63 – 66 of this thesis.

6.2 Literature Review

Even though several studies have looked at the performance of ethical funds versus the market index & conventional funds (e.g. Luther et. al., 1994; Mallin et. al., 1995; Geczy et. al., 2003; Bauer et. al., 2005; Bollen, 2007), there is limited research which compares performance within the set of ethical funds i.e. the issue of ethical criteria & performance: do ethical funds operating under certain criterion outperform other ethical funds? Only two previous studies have tried to evaluate the effect of criteria on fund performance.

The first was by Goldreyer et. al. (1999), they extended their performance evaluation study to evaluate the effect of screens on the performance of ethical

funds. They found that ethical funds employing positive screens in their investment process outperform ethical funds that do not employ positive screening. This implies that there is financial value to be derived by investing in companies with positive SRI practices.

They studied 49 US ethical equity & bond funds, within those they identified 28 that employed positive screening & 10 that didn't. They defined positive screening as, "a portfolio selection strategy in which the portfolio manager specifically includes firms in his/her portfolio that conduct some positively regarded social policy ..." (p. 25). They calculated 3 portfolio measures for each fund viz. Jensen's Alpha, Sharpe Ratio & Treynor Ratio and then compared the average of the ratios for the set of funds that employ positive screening with the other set; they used the Wilcoxon Signed- Rank test to check if the difference in the two means was statistically significant. They found that the differences were significant for the Jensen's Alpha but not for the other two ratios. Based on their finding they concluded that positively screened funds perform better than the rest.

The second study was by Renneboog et. al. (2008a), they found that ethical funds which invest in firms employing a community involvement policy or have an in house SRI team to conduct ethical research to decide which firms to invest in, have better returns than ethical funds which do not do so. They define community involvement as, "providing services to low-income individuals or small businesses in local communities, such as job training, child care, and healthcare" (p. 320).

They studied the performance of ethical funds globally i.e. across 17 countries. In order to isolate the effect of ethical criteria on performance they ran a regression with excess fund returns as the dependent variable and the following independent variables: various screening activities (ethical criteria) employed by the funds viz. activism policy, community involvement, in house ethical research, Islamic principles & number of screens employed. As control variables they used fund characteristics (age, size, risk, management fees, load fees, fund family size) investment styles (investing abroad & the four factors of the Carhart (1997) model viz. β_{MKT}, β_{SMB}, β_{HML}, and β_{MOM}) and fixed effects (country & time). The last item is used to control for unobserved differences in money flows across various time periods & countries. Upon running the regression they found: ethical funds that adopted community involvement as an investment criteria generated an extra 3.6% per annum in returns. Similarly, funds that employed an in house ethical research team generated 1.2% per annum in extra returns.

Our study not just brings a more robust MCSD methodology to the topic but also extends previous studies by comparing performance of ethical funds based on ethical criteria, nature of ethical research employed (internal or internal plus external) and geographic investment universe (funds investing locally versus funds investing globally).

6.3 Data Set

To create the data set we first identify all the ethical mutual funds (also known as unit trusts and investment trusts) listed in the UK. For this we use the EIRIS website which lists names and details of UK ethical funds. Since we are focussed on equity investments we delete from this list funds that have less than 70% of assets invested in shares. This is the standard threshold used for qualifying a fund as an equity fund, not just in previous studies but also in the financial services industry. We also delete index funds as also those that are funds of funds i.e. funds which invest in other ethical funds. Next we cross check our list for robustness with the list of ethical funds available on the Investment Management Association (IMA) website. The IMA is the parent body for asset management companies in the UK. Eventually we end up with 42 ethical funds.

From within this list we select funds that have 10 years or more of data. We do this for two reasons, one – a 10 year period covers an entire business cycle and two – it eliminates funds employing criteria that may have been passing fads. After the said eliminations we end up with our final sample of 29 ethical funds. The 10 year data period extends from August 2001 to July 2011. We collect monthly closing prices for two broad based indices, one local & one global viz. the FTSE All Share & the FTSE All World respectively. Next we collect monthly NAVs (Net Asset Values) for each fund from DataStream. A fund's expenses i.e. day to day expenses, depository fees, management fees, salaries, bonuses, etc. are captured by TER – total expense ratio – annual expenses stated as a percentage of assets under management; the NAVs provided by DataStream are net of fees i.e.

the TER fees have already been deducted before reporting the NAVs. All the data is collected in the same currency viz. GBP (£); this is done to prevent the effect of currency conversion & fluctuations on performance calculations. Even though some funds use the MSCI World as the benchmark index we prefer to replace it with the FTSE All World since DataStream provides values in GBP for the latter but not for the former. Looking at the composition of the two global indices we find them to be almost identical. Next we calculate an arithmetic return series for each fund and benchmark index using the formula below:

$$R_{i,t} = (P_{i,t} / P_{i,t-1}) - 1$$

Where:

$R_{i,t}$ = Return for fund/index i in month t

$P_{i,t}$ = Closing price for fund/index i in month t

$P_{i,t-1}$ = Closing price for fund/index i in month t-1

Since normally distributed data is an important assumption of mean variance analysis, we test each return series for normality using the Shapiro-Wilk test since it is widely considered to be the most accurate test for normality. It has been argued that equity data is more likely to be log-normally distributed than normally distributed since equity prices cannot be negative, hence we also test to see if the data is log-normally distributed using the Shapiro-Wilk test. We find similar results in both cases, we list here the results for the arithmetic returns series since those are used in our study. As stated earlier, there is ample evidence in literature

to suggest that investors prefer positive skewness and eschew excess kurtosis, hence we also calculate the skewness and kurtosis statistics. Table 6.1 lists descriptive statistics for the 29 ethical funds. We find that the return series are non-normally distributed in 100% of the cases (29/29 fund return series are non-normally distributed) with statistically significant (at the 5% level) negative skewness in 100% of the cases (29/29 fund return series) and statistically significant (at the 5% level) excess kurtosis in 72% of the cases (21/29 fund return series). These findings substantially weaken the case for using a Mean-Variance approach to compare performance.

Table 6.1 lists descriptive statistics for the 29 ethical funds.

Fund ID	Name	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S. Test **	K. Test ***
1	Aberdeen Ethical World	-.1293	.1109	.0053	.0493	-.57	.26	No	SIG	INSIG
2	AEGON Ethical Equity	-.1619	.0903	.0059	.0476	-.88	1.31	No	SIG	SIG
3	The Amity UK	-.1448	.1285	.0030	.0434	-.74	1.34	No	SIG	SIG
4	Aviva Investors UK Ethical	-.1771	.0952	.0042	.0479	-.91	1.44	No	SIG	SIG
5	Aviva Investors S. F. Absolute Growth	-.1688	.1420	.0034	.0543	-.71	.93	No	SIG	SIG
6	Aviva Investors S. F. European Growth	-.1211	.1345	.0056	.0487	-.59	.42	No	SIG	INSIG
7	Aviva Investors S. F. Global Growth	-.1259	.0881	.0007	.0471	-.72	.15	No	SIG	INSIG
8	Aviva Investors S. F. UK Growth	-.1694	.0932	.0035	.0464	-.93	1.49	No	SIG	SIG
9	CIS Sustainable Leaders Trust	-.1467	.1057	.0026	.0440	-.80	.91	No	SIG	SIG
10	F&C Stewardship Growth	-.1511	.1149	.0034	.0455	-.83	1.03	No	SIG	SIG
11	F&C Stewardship Income	-.1565	.1088	.0051	.0378	-1.06	2.67	No	SIG	SIG
12	F&C Stewardship International	-.1198	.0931	.0027	.0467	-.60	.09	No	SIG	INSIG
13	Family Charities Ethical	-.1913	.1006	.0003	.0486	-1.12	2.24	No	SIG	SIG
14	Halifax Ethical	-.1273	.1368	.0024	.0489	-.52	.60	No	SIG	INSIG
15	Henderson Global Care Growth	-.1351	.1062	.0026	.0493	-.69	.39	No	SIG	INSIG
16	Henderson Global Care Managed	-.1201	.0730	.0034	.0375	-.94	1.26	No	SIG	SIG
17	Henderson Global Care UK Income	-.1774	.1298	.0006	.0465	-.86	2.06	No	SIG	SIG
18	Henderson Industries of the Future	-.1377	.1070	.0028	.0482	-.69	.52	No	SIG	INSIG
19	Jupiter Ecology	-.1721	.1162	.0032	.0518	-.82	1.07	No	SIG	SIG
20	Jupiter Environmental Income	-.1728	.1054	.0039	.0468	-.89	1.70	No	SIG	SIG
21	Legal & General Ethical	-.1826	.1234	.0041	.0500	-.77	1.53	No	SIG	SIG

Fund ID	Name	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S. Test **	K. Test ***
22	Premier Ethical	-.1501	.0934	.0020	.0438	-.91	1.31	No	SIG	SIG
23	Prudential Ethical	-.2027	.1200	.0015	.0517	-.77	1.89	No	SIG	SIG
24	Scottish Life UK Ethical	-.1568	.0877	.0063	.0468	-.85	1.17	No	SIG	SIG
25	Scottish Widows Environmental Investor	-.1938	.1381	.0005	.0467	-.84	2.65	No	SIG	SIG
26	Scottish Widows Ethical	-.2064	.1249	.0014	.0459	-1.07	3.43	No	SIG	SIG
27	Sovereign Ethical	-.1842	.1186	.0000	.0516	-.84	1.36	No	SIG	SIG
28	Standard Life UK Ethical	-.1999	.1396	.0054	.0506	-.95	2.56	No	SIG	SIG
29	St. James Place Ethical	-.1402	.1232	.0044	.0509	-.64	.59	No	SIG	INSIG

* For a normal distribution, the value of the excess kurtosis statistic calculated by SPSS is zero.

** S.Test in SPSS checks to see if the skewness calculated is statistically significant.

*** K.Test in SPSS checks to see if the kurtosis calculated is statistically significant.

SIG = Statistically significant, INSIG = Statistically insignificant, both at the 5% level.

Now we look at the specific criteria employed by ethical funds and other fund specific characteristics. EIRIS has an online database that provides detailed information about each fund's ethical investment strategy. **Table 6.2 lists the 29 ethical funds with a summary of their specific characteristics.**

Fund ID	Fund Name	Ethical Policies	Ethical Research	Benchmark Index	Geo Area
1	Aberdeen Ethical World	All	IH+ER	FTSE All Share	Local
2	AEGON Ethical Equity	N. Screen	IH	FTSE All Share	Local
3	The Amity UK	NP. Screen	IH	FTSE All Share	Local
4	Aviva Inv. UK Ethical	All	IH+ER	FTSE All Share	Local
5	Aviva Inv. S. F. Absolute Growth	All	IH+ER	MSCI World	Global
6	Aviva Inv. S. F. European Growth	All	IH+ER	FTSE All World	Global
7	Aviva Inv. S. F. Global Growth	All	IH+ER	MSCI World	Global
8	Aviva Inv. S. F. UK Growth	All	IH+ER	FTSE All Share	Local
9	CIS Sustainable Leaders Trust	All	IH	FTSE All Share	Local
10	F&C Stewardship Growth	All	IH+ER	FTSE All Share	Local
11	F&C Stewardship Income	All	IH+ER	FTSE All Share	Local
12	F&C Stewardship International	All	IH+ER	MSCI World	Global
13	Family Charities Ethical	N. Screen	IH+ER	FTSE All Share	Local
14	Halifax Ethical	All	IH+ER	FTSE All World	Global
15	Henderson Global Care Growth	All	IH	MSCI World	Global
16	Henderson Global Care Managed	All	IH	MSCI World	Global
17	Henderson Global Care UK Income	All	IH	FTSE All Share	Local
18	Henderson Industries of the Future	All	IH	MSCI World	Global
19	Jupiter Ecology	All	IH	FTSE All World	Global
20	Jupiter Environmental Income	All	IH	FTSE All Share	Local
21	Legal & General Ethical	N. Screen	IH+ER	FTSE All Share	Local
22	Premier Ethical	NP. Screen	IH+ER	FTSE All Share	Local
23	Prudential Ethical	N. Screen	IH+ER	FTSE All Share	Local
24	Scottish Life UK Ethical	NP. Screen	IH+ER	FTSE All Share	Local
25	Scottish Widows Environ. Investor	All	IH+ER	FTSE All Share	Local
26	Scottish Widows Ethical	All	IH+ER	FTSE All Share	Local
27	Sovereign Ethical	NP. Screen	IH+ER	FTSE All Share	Local
28	Standard Life UK Ethical	All	IH+ER	FTSE All Share	Local
29	St. James Place Ethical	All	IH+ER	MSCI World	Global

N.Screen = Negative screening only, NP.Screen = Negative & Positive screening only.
All = N. Screen, NP. Screen & Engagement. Geo Area = Geographical investment universe.
Local = invest only in UK listed firms. Global = invest in firms listed in UK & outside UK.
IH = In house ethical research only. IH+ER = in house plus external ethical research used.

6.4 Methodology

We apply the MCSD methodology as detailed in Section 3.7 (chapter 3 sub-section 7, pp. 67 – 68) of this thesis.

From the original data set we form 4 groups. Each group consists of two sets of funds, each set contains all the funds from the original 29 which belong to a similar criteria. The four groups are as below. **Tables 6.3, 6.4, 6.5 & 6.6 provide details of each group.**

1. Funds that employ only negative screening versus funds that employ negative & positive screening.

2. Funds that employ all ethical strategies versus funds that only employ screening.

3. Funds that only rely on in house ethical research versus funds that use both in house & external ethical research.

4. Funds that invest only in UK firms versus funds that invest globally i.e. in UK firms as well as in firms listed outside the UK.

Within each group we take all the funds listed in a set and form an equally weighted portfolio by using them. For example, within a group we have two sets – Set1 & Set2. If Set1 has 4 funds then we form a portfolio P1 which is made out of the 4 funds, each fund having a portfolio weight equal to 25%. If Set2 has 8 funds then we form a portfolio P2 made out of the 8 funds with each fund contributing 12.5% to P2. Next we identify a benchmark (market index) that is common to all

the 12 funds in the group; we use this as the wealth index for ranking outcomes in an ascending order. Now we compare P1with P2 using MCSD. If P1 dominates P2 then clearly P1 will be favoured by all risk averse utility maximizing investors over P2 and thus can be said to have outperformed P2, and vice versa. Next we MCSD-compare the portfolios P1and P2 individually with the market index (which serves as a proxy for the market). If the market portfolio is dominated by a fund then increasing the share of that one fund and reducing the proportion of all the other assets in the market portfolio improves the original portfolio for all risk-averse investors (Shalit and Yitzhaki, 1994). Thus clearly if a portfolio (P1 and/or P2) dominates the market then it has outperformed the market. We apply the aforementioned procedure to all the 4 groups.

6.5 Results & Analysis

In this section we look at the results obtained and analyse the same. In order to simplify the latter we report our findings group wise.

Group 1 – please refer Table 6.3

In this case we compare the performance of funds that employ only negative screening with those that employ both negative & positive screening. We form the following two portfolios:

NPF – an equally weighted portfolio of funds that employ only negative screening.

NPPF – an equally weighted portfolio of funds that employ both negative & positive screening.

We do not find any dominance in this case. Neither between the two sets of funds nor between those sets and the market. Since all funds that employ screening invest only locally we cannot make a comparison of their local versus global performance.

Table 6.3: Only Negative Screening v/s Negative & Positive Screening

Fund ID	Fund Name	Ethical Policies	Benchmark Index	Geo Inv Area
2	AEGON Ethical Equity	N. Screen	FTSE All Share	Local
13	Family Charities Ethical	N. Screen	FTSE All Share	Local
21	Legal & General Ethical	N. Screen	FTSE All Share	Local
24	Prudential Ethical	N. Screen	FTSE All Share	Local
3	The Amity UK	NP. Screen	FTSE All Share	Local
23	Premier Ethical	NP. Screen	FTSE All Share	Local
25	Scottish Life UK Ethical	NP. Screen	FTSE All Share	Local
28	Sovereign Ethical	NP. Screen	FTSE All Share	Local

N.Screen = Negative screening only, NP.Screen = Negative & Positive screening only.
Geo Inv Area = Geographical investment universe.
Local = invest only in UK listed firms.

NPF = an equally weighted portfolio of the 4 funds that employ N.Screen
NPPF = an equally weighted portfolio of the 4 funds that employ NP.Screen

Table 6.4: Only Screening v/s All Ethical Criteria

Fund ID	Fund Name	Ethical Policies	Benchmark Index	Geo Inv Area
2	AEGON Ethical Equity	N. Screen	FTSE All Share	Local
3	The Amity UK	NP. Screen	FTSE All Share	Local
13	Family Charities Ethical	N. Screen	FTSE All Share	Local
21	Legal & General Ethical	N. Screen	FTSE All Share	Local
22	Premier Ethical	NP. Screen	FTSE All Share	Local
23	Prudential Ethical	N. Screen	FTSE All Share	Local
24	Scottish Life UK Ethical	NP. Screen	FTSE All Share	Local
27	Sovereign Ethical	NP. Screen	FTSE All Share	Local
1	Aberdeen Ethical World	All	FTSE All Share	Local
4	Aviva Investors UK Ethical	All	FTSE All Share	Local
5	Aviva Inv. S. F. Absolute Growth	All	MSCI World	Global
6	Aviva Inv. S. F. European Growth	All	FTSE All World	Global
7	Aviva Inv. S. F. Global Growth	All	MSCI World	Global
8	Aviva Inv. S. F. UK Growth	All	FTSE All Share	Local
9	CIS Sustainable Leaders Trust	All	FTSE All Share	Local
10	F&C Stewardship Growth	All	FTSE All Share	Local
11	F&C Stewardship Income	All	FTSE All Share	Local
12	F&C Stewardship International	All	MSCI World	Global
14	Halifax Ethical	All	FTSE All World	Global
15	Henderson Global Care Growth	All	MSCI World	Global
16	Henderson Global Care Managed	All	MSCI World	Global
17	Henderson Global Care UK Income	All	FTSE All Share	Local
18	Henderson Industries of the Future	All	MSCI World	Global
19	Jupiter Ecology	All	FTSE All World	Global
20	Jupiter Environmental Income	All	FTSE All Share	Local
25	Scottish Widows Environ. Investor	All	FTSE All Share	Local
26	Scottish Widows Ethical	All	FTSE All Share	Local
28	Standard Life UK Ethical	All	FTSE All Share	Local
29	St. James Place Ethical	All	MSCI World	Global

N.Screen = Negative screening only. NP.Screen = Negative & Positive screening only.
All = N. Screen, NP. Screen & Engagement. Geo Inv Area = Geographical investment universe.
Local = invest only in UK listed firms. Global = invest in firms listed in UK & outside UK.

APF = an equally weighted portfolio of the 21 funds that employ "ALL" ethical policies.
SPF = an equally weighted portfolio of the 8 funds that employ only screening (N.Screen or NP.Screen).

APFL = an equally weighted portfolio of 11 funds that employ "ALL" ethical policies & invest locally.
APFG = an equally weighted portfolio of 10 funds that employ "ALL" ethical policies & invest globally.

Table 6.5: In House v/s In House plus External – Ethical Research

Fund ID	Fund Name	Ethical Research	Benchmark Index	Geo Inv Area
2	AEGON Ethical Equity	IH	FTSE All Share	Local
3	The Amity UK	IH	FTSE All Share	Local
9	CIS Sustainable Leaders Trust	IH	FTSE All Share	Local
15	Henderson Global Care Growth	IH	MSCI World	Global
16	Henderson Global Care Managed	IH	MSCI World	Global
17	Henderson Global Care UK Income	IH	FTSE All Share	Local
18	Henderson Industries of the Future	IH	MSCI World	Global
19	Jupiter Ecology	IH	FTSE All World	Global
20	Jupiter Environmental Income	IH	FTSE All Share	Local
1	Aberdeen Ethical World	IH+ER	FTSE All Share	Local
4	Aviva Investors UK Ethical	IH+ER	FTSE All Share	Local
5	Aviva Investors S. F. Absolute Growth	IH+ER	MSCI World	Global
6	Aviva Investors S. F. European Growth	IH+ER	FTSE All World	Global
7	Aviva Investors S. F. Global Growth	IH+ER	MSCI World	Global
8	Aviva Investors S. F. UK Growth	IH+ER	FTSE All Share	Local
10	F&C Stewardship Growth	IH+ER	FTSE All Share	Local
11	F&C Stewardship Income	IH+ER	FTSE All Share	Local
12	F&C Stewardship International	IH+ER	MSCI World	Global
13	Family Charities Ethical	IH+ER	FTSE All Share	Local
14	Halifax Ethical	IH+ER	FTSE All World	Global
21	Legal & General Ethical	IH+ER	FTSE All Share	Local
22	Premier Ethical	IH+ER	FTSE All Share	Local
23	Prudential Ethical	IH+ER	FTSE All Share	Local
24	Scottish Life UK Ethical	IH+ER	FTSE All Share	Local
25	Scottish Widows Environ. Investor	IH+ER	FTSE All Share	Local
26	Scottish Widows Ethical	IH+ER	FTSE All Share	Local
27	Sovereign Ethical	IH+ER	FTSE All Share	Local
28	Standard Life UK Ethical	IH+ER	FTSE All Share	Local
29	St. James Place Ethical	IH+ER	MSCI World	Global

Geo Inv Area = Geographical investment universe.
Local = invest only in UK listed firms. Global = invest in firms listed in UK & outside UK.
IH = In house ethical research only. IH+ER = in house plus external ethical research used.

OIRPF – an EWP of the 9 funds that employ only internal ethical research.
IAXRPF – an EWP of the 20 funds that employ both internal and external ethical research.
OIRPFL – an EWP of the 5 funds that employ only internal ethical research & invest locally.
OIRPFG – an EWP of the 4 funds that employ only internal ethical research & invest globally.
IAXRPFL – an EWP of the 14 funds that employ both internal & external ethical research & invest locally.
IAXRPFG – an EWP of the 6 funds that employ both internal & external ethical research & invest globally.
* EWP = equally weighted portfolio

Table 6.6: Local v/s Global

Fund ID	Fund Name	Benchmark Index	Geo Inv Area
5	Aviva Investors S. F. Absolute Growth	MSCI World	Global
6	Aviva Investors S. F. European Growth	FTSE All World	Global
7	Aviva Investors S. F. Global Growth	MSCI World	Global
12	F&C Stewardship International	MSCI World	Global
14	Halifax Ethical	FTSE All World	Global
15	Henderson Global Care Growth	MSCI World	Global
16	Henderson Global Care Managed	MSCI World	Global
18	Henderson Industries of the Future	MSCI World	Global
19	Jupiter Ecology	FTSE All World	Global
29	St. James Place Ethical	MSCI World	Global
1	Aberdeen Ethical World	FTSE All Share	Local
2	AEGON Ethical Equity	FTSE All Share	Local
3	The Amity UK	FTSE All Share	Local
4	Aviva Investors UK Ethical	FTSE All Share	Local
8	Aviva Investors S. F. UK Growth	FTSE All Share	Local
9	CIS Sustainable Leaders Trust	FTSE All Share	Local
10	F&C Stewardship Growth	FTSE All Share	Local
11	F&C Stewardship Income	FTSE All Share	Local
13	Family Charities Ethical	FTSE All Share	Local
17	Henderson Global Care UK Income	FTSE All Share	Local
20	Jupiter Environmental Income	FTSE All Share	Local
21	Legal & General Ethical	FTSE All Share	Local
22	Premier Ethical	FTSE All Share	Local
23	Prudential Ethical	FTSE All Share	Local
24	Scottish Life UK Ethical	FTSE All Share	Local
25	Scottish Widows Environmental Investor	FTSE All Share	Local
26	Scottish Widows Ethical	FTSE All Share	Local
27	Sovereign Ethical	FTSE All Share	Local
28	Standard Life UK Ethical	FTSE All Share	Local

Geo Inv Area = Geographical investment universe.
Local = invest only in UK listed firms. Global = invest in firms listed in UK & outside UK.

LPF – an equally weighted portfolio of the 19 funds that invest only locally.
GPF – an equally weighted portfolio of the 10 funds that invest globally.

Group 2 – please refer Table 6.4

In this case we compare the performance of funds that employ "all" ethical criteria versus funds that employ only screening as an ethical criteria. We form the following two portfolios:

APF – an equally weighted portfolio of funds that employ all ethical criteria i.e. a comprehensive ethical strategy.

SPF – an equally weighted portfolio of funds that employ only screening.

We did not find any dominance between the two portfolios. However, we did find that the set of funds employing "all" ethical criteria i.e. a comprehensive ethical strategy (APF) dominate the market (both the FTSE All World & FTSE All Share) while the set of funds that employ only screening (SPF) do not dominate the market. This means investors who choose to invest in ethical funds that employ a comprehensive ethical strategy would beat the market while those investing in funds that employ only screening would not. This could be because a comprehensive ethical strategy allows funds managers to choose from a bigger prospective investment set whereas an only screening approach limits the set of investment alternatives available to the fund managers.

Next we identify from within each set, funds that invest only in UK firms versus funds that invest globally. Thus we form the following new portfolios:

APFL – an equally weighted portfolio of funds that use a comprehensive ethical strategy & invest only locally.

APFG – an equally weighted portfolio of funds that use a comprehensive ethical strategy & invest globally.

We find that APFL dominates both the FTSE All World & the FTSE All Share while APFG dominates neither. Thus we find that funds investing locally do better than the market whereas funds investing globally show no such dominance of the market. We could not find any dominance between APFL & APFG. Since all funds that employ only screening invest only locally we cannot make a comparison of their local versus global performance.

Group 3 – please refer Table 6.5

In this case we compare performance between funds that employ only internal ethical research versus funds that employ both internal & external ethical research. We form the following two portfolios:

OIRPF – an equally weighted portfolio of funds that employ only internal ethical research.

IAXRPF – an equally weighted portfolio of funds that employ both internal and external ethical research.

Once again there is no dominance between the two portfolios. However, we find that both portfolios dominate the FTSE All World as well as the FTSE All Share. Thus ethical investors do better than the market in both cases i.e. whether they invest in funds that employ only internal or internal & external ethical research. Thus the source (internal/external) of ethical research used does not influence performance. This finding is contrary to Renneboog et. al. (2008a), who found

that only funds which employed an in house ethical research team generated 1.2% per annum in extra returns.

Next we identify from within each set, funds that invest only in UK firms versus funds that invest globally. Thus we form the following new portfolios:

OIRPFL – an equally weighted portfolio of funds that employ only internal ethical research & invest locally.

OIRPFG – an equally weighted portfolio of funds that employ only internal ethical research & invest globally.

IAXRPFL – an equally weighted portfolio of funds that employ both internal and external ethical research & invest locally.

IAXRPFG – an equally weighted portfolio of funds that employ both internal and external ethical research & invest globally.

We find that, once again both local portfolios (OIRPFL & IAXRPFL) dominate the FTSE All World & FTSE All Share whereas the global portfolios (OIRPFG & IAXRPFG) dominate neither. Thus investors would be better off investing in ethical funds that invest locally. We could not find any other dominances within the set of above 4 portfolios.

Group 4 – please refer Table 6.6

In this case we specifically look at funds that invest only locally (in UK listed firms only) versus funds that invest globally (UK plus outside UK listed firms). We form the following two portfolios:

LPF – an equally weighted portfolio of funds that invest only locally.

GPF – an equally weighted portfolio of funds that invest globally.

In our previous group analysis we have consistently found local funds dominating the market whereas global funds failing to do so. Here too we find that LPF dominates both the FTSE All World & the FTSE All Share whereas GPF fails to do so. Thus ethical investors would benefit from choosing UK focussed funds to invest in. Global funds have a bigger investment universe to choose from and thus it seems odd that they come out poorer in comparison to local funds; but since all the 29 ethical funds are UK based, it seems that the fund managers have a "home field advantage" when it comes to picking stocks – perhaps due to better informational access obtained through a closer interaction with the management teams of local firms and greater experience & hence expertise with local issues; both of which may lead to a superior analysis of local firms as compared to foreign ones.

And finally, we form an equally weighted portfolio of all the 29 ethical funds (EPF) and MCSD-compare its performance with the market i.e. FTSE All World & FTSE All Share. We find that EPF dominates both those market indices. Thus ethical investors would do better in terms of both risk & returns by investing in these funds as opposed to investing in those market indices.

In this study we have found an equally weighted portfolio of ethical funds as well as sub sets of the same to dominate the FTSE All World & FTSE All Share indices; since both those indices are pretty broad based this is a substantial finding which is further strengthened by the fact that the fund NAV's used in this study

are net off fees. Thus these funds dominate the market even after deducting management fees & other operating costs. However, our finding is weakened by the presence of survivor bias in our sample of funds.

6.6 Conclusion

In this study we compare performance within a set of 29 ethical funds. We divide them into sets according to certain criteria and compare performance between a set of funds that subscribe to the said criteria and those that don't. We find that the set of funds which invest by applying "all" i.e. comprehensive ethical criteria dominate the market. We also find consistently that funds which invest locally dominate the market while those investing globally do not. Thus all risk averse utility maximizing investors would benefit by reducing the proportion of their investment in the market portfolio and increasing the same in the dominant funds. This dominance of the market is net of fees i.e. after incorporating the management fees & operating expenses charged by the said funds. Whether the funds rely on only internal ethical research or internal plus external ethical research has no bearing on performance – both of those sets dominate the market.

Chapter 7 – Conclusion and Recommendations

7.1 Introduction

In this chapter we present an overview of the thesis. First we discuss the three research questions, next we highlight the setting for the thesis i.e. backdrop & previous studies, and finally we discuss empirical testing & findings. In short, this chapter brings together all the main arguments of this thesis.

7.2 Research Questions

This thesis focuses on the performance of UK based ethical funds; our three research questions can be succinctly summarised as below:

1. Do ethical funds outperform/underperform similar conventional funds?
2. Do ethical indices outperform/underperform similar conventional indices?
3. Within the set of ethical funds, do certain type of ethical funds outperform/underperform their peers?

7.3 Background

In Chapter 2 we looked at the setting of this thesis viz. the ethical fund management movement; this emphasises the importance of our study i.e. why is it important to study the performance of ethical funds?

Ethical fund management is older than one might imagine; it was initiated by US based church organisations who wanted to avoid investing in firms operating in the business of things they principally opposed viz. alcohol, tobacco and the manufacturing of arms (Sparkes, 1995). Subsequently the first known ethical fund was set up in 1928 in the US. This idea of investing ethically became more popular during the 1960's civil, women & environmental rights movements (Kinder & Domini, 1997 and Henningsen, 2002) and the 1980's anti apartheid movement. It was during this time that UK's first ethical fund, Friends Provident Stewardship, was launched in 1984; this fund is still alive & thriving. However it was only during the 1990's that ethical fund management started to become widely popular. With the setting up of special ethical indices devoted to ethical companies, it started to come out of the shadows. It received legislative support from several governments in developed countries; for example the UK government enacted pension regulations that required the trustees of pension funds to declare how their investment strategy had taken into consideration social responsibility. Even so, ethical investing was treated as a fad by the wider finance community. A fad they thought would either pass off soon or be limited to the fringes. But as things stand now, ethical investments account for roughly eleven per cent of all assets under management with mutual funds in the US (SIF, 2008)

and twenty two per cent of all assets under management with mutual funds in the UK (UKSIF, 2008). Such widespread prominence puts it in a position where it can no longer be neglected.

7.4 Literature Review

In Chapter 3 we looked at the previous work done on the topic of ethical fund performance. We also highlighted the gap present and how this thesis intends to fill it. In effect, we looked at what's been done till date on this topic and how our thesis will make a contribution to the same.

All previous studies on the performance of ethical funds operate under one of the following two hypotheses. We too subscribe to these hypotheses but wish to test for them using a better methodology than those adopted by previous studies.

1. Ethical funds underperform conventional funds – since ethical criteria reduces size of the investment universe available for such funds to invest in. Furthermore, sin stocks like tobacco, gambling & alcohol are resilient to economic downturns and hence tend to outperform the market – since ethical funds avoid investing in these stocks they are likely to underperform conventional funds which make no such exclusions.
2. Ethical funds outperform conventional funds – good ethical practices of a firm not just points towards good management but also protects the firm from future litigation & scandals and the associated costs. Thus ethical

firms and consequently the ethical funds investing exclusively in such firms are likely to outperform their conventional counterparts.

Numerous studies have evaluated the performance of ethical funds & indices and compared the same with conventional funds & indices. It's important to note a few things about previous studies and how our study contributes to the current literature.

All previous studies use Mean Variance analysis (MV) and/or asset pricing models for comparing performance. More specifically, they use Sharpe ratio and/or alpha (either Jensen's alpha which is estimated using CAPM or the alpha from the 3 factor Fama & French model or the 4 factor Carhart model) as indicators of performance. Some studies also construct their own models in order to explain returns. A model based approach makes a rather bold assumption, that the specified models accurately represent the complex reality of asset returns. Additionally, most previous studies don't specify the R-square values of their model regressions thus making it difficult to ascertain goodness of fit.

Our study is the first to use Marginal Conditional Stochastic Dominance (MCSD) to compare performance. Although the hypothesis of performance is the same i.e. we too are checking to see if ethical fund & indices out/under perform conventional ones, we believe MCSD is a better method for comparing performance than MV and/or model based approaches for the following reasons.

Mean variance analysis holds under the following conditions: the return are normally distributed and/or the investor utility function is quadratic (Baron, 1977;

Collins and Gbur, 1991; Johnstone and Lindley, 2010; Markowitz, 1959; Mossin, 1973). Both these assumptions are restrictive. Returns may not be normally distributed, this can be verified using statistical tests but none of the previous studies talk about this; neither do they state whether tests were conducted to check the return distributions for normality. This is the first study to talk about the issue of normality and test for it. In the empirical chapters we found that in almost all cases the returns series were non-normally distributed – this substantially weakens the case for using an MV approach.

The second assumption, investor utility function is quadratic, is especially restrictive since there may be a number of investors who have a concave utility function but one that is not quadratic. In fact past studies have shown that investors show a preference for positive skewness and an aversion to kurtosis (Kraus et. al., 1976; Athayde et. al., 1997; Dittmar, 2002; Post et. al., 2003). This cannot be incorporated into a quadratic utility function since its third derivative is zero and its fourth derivative is undefined. More generally speaking, we can never know the exact utility function for all investors, thus we make some assumptions. MCSD makes weaker assumptions i.e. it only assumes that the investor utility function is non-decreasing and that investors are risk averse. This gives us a concave utility function and yet allowing for the utility function to incorporate the investor attitudes towards skewness and kurtosis. Thus performance evaluation using MCSD would hold for a much larger set of utility functions and hence for a greater number of investors than MV. In effect, the set of utility functions under which MV holds is a subset of the set of utility functions under which MCSD holds. This clearly demonstrates the superiority of MCSD over MV.

Even if the above conditions are met, MCSD is still superior to MV since it considers the entire range of the distributions while comparing the two indices as opposed to only comparing the first two moments, namely, mean and variance.

And finally, as stated earlier, an MCSD approach is free from the need to correctly specify asset pricing models.

Having said that, MV has been preferred over the years since it's computationally less intensive and also since it makes for a generalised comparison i.e. one could calculate the means and variances of several assets and then simply compare them with each other; while on the other hand using an MCSD approach entails pair wise comparisons. Another limitation of MCSD is that in certain cases it can produce inconclusive result i.e. when we compare two assets, it is likely that an MCSD comparison may give us the following inconclusive result: neither asset dominates or outperforms the other. However, we feel it is better to not reach a conclusion than reach a wrong one as may be the case when studies are restricted to MV analysis without taking into account pertinent issues like investor attitudes towards skewness & kurtosis and non-normality of the return distributions.

7.5 Empirical Findings

In this section we look at the key findings of the three empirical chapters viz. Chapters 4, 5 & 6. Ethical investors can be categorised as active & passive; passive investors are those who believe in the efficient market hypothesis (Fama, 1970) and hence don't try to outperform the market but instead invest in the

market index. Active investors on the other hand are those who believe it is possible to outperform the market and hence "actively" seek out investments that they think will be able to beat the market.

7.5.1 Chapter 4 – Active

In Chapter 4 we look at active ethical fund management. Comparing the performance of ethical funds with conventional ones and/or the market is a well studied area. There are several studies on this topic, some of which use a matched pair approach (Mallin et. al. 1995, Gregory et. al. 1997 & 2007 and Kreander et. al., 2005). The latter argue that the difference in performance between ethical & conventional funds may arise due to other factors like fund size, age & investment universe, so in order to isolate the effect of the ethical nature of the investment on performance they first match the ethical funds with similar conventional ones using the criteria of size, age, investment universe & country and then compared their performance. We subscribe to the aforementioned technique of controlling for confounding variables and add an extra variable to the matching criteria: fund management company; this in our view gives us even closer matches. All previous studies used an MV and/or asset pricing model approach; this is the first study to use the more robust MCSD methodology.

We compare the performance of UK ethical funds with similar matched conventional ones as also the market. We find that in 3/23 cases the conventional fund dominates the ethical one and in 2/23 cases the ethical fund dominates the conventional one. In rest of the cases there is no dominance. This implies that

there is no significant outperformance either ways; this finding is in line with previous studies. We also find that in 11/23 cases the ethical fund dominates the market. A similar picture exists for conventional funds, they dominate the market in 12/23 cases. What is further significant is that in none of the 46 cases does the market dominate an ethical or conventional fund. This finding is not in line with previous studies. Theoretically speaking a well diversified market index should not be dominated by a fund but according to our results both ethical and conventional funds convincingly dominate the market. This clearly implies that the fund managers are able to pick winners and hence outperform the market (but not each other). We believe previous studies may have failed to capture this due to the poorer methodologies adopted by them.

Our finding is further strengthened by the fact that the said dominance is after fees i.e. these funds dominate the market even after deducting management fees & other operating costs. As with past studies our sample too suffers from a survivor bias and this to some extent weakens the generalisability of our findings. Having said that, we cannot ignore the fact that if investors are able to select the right funds to invest in they can outperform the market.

7.5.2 Chapter 5 – Passive

In Chapter 5 we look at passive ethical fund management; we compare the performance of the FTSE4Good Series of ethical indices with that of similar conventional indices. The performance of ethical indices is not a very well studied area, there are a limited number of studies on this topic. Once again, previous

studies on the performance of ethical indices (Sauer 1997, Statman 2000 & 2006) and more specifically the two studies on the performance of the FTSE4Good Index Series (Schroder 2007 & Collison et. al. 2008) have used an MV and/or model based approach; our study is the first to apply an MCSD approach.

In all we study 19 indices over a period of almost 10 years since the launch of the FTSE4Good index series in July 2001. First we use MV analysis, we find that it produces largely inconclusive results. The Sharpe and Treynor ratios are all negative and thus meaningless while almost all the Jensen alphas are insignificant. The MV methodology is further weakened by the fact that none of the index return series are normally distributed.

Next we use the MCSD methodology; we find more conclusive results. The FTSE4Good-US-100 ethical index when compared with a similar conventional index the S&P 100, is found to be dominated by the S&P-100. The said ethical index is also found to be dominated by the more well diversified S&P-500 as also the less diversified DJIA-30. We also find that the ethical FTSE4Good-Global-100 index is dominated by the conventional S&P-Global-100 index. Thus in the US and Global context a passive ethical index investor has to pay a price for being ethical; in the UK and EU context the ethical index investor pays no such price.

7.5.3 Chapter 6 – Criteria

In Chapter 6 we look at the issue of criteria i.e. within the set of UK based ethical funds, do certain type of ethical funds dominate others? This is only the third

study to address this question. The first study used an MV approach (Goldreyer et. al., 1999) while the second (Renneboog et. al., 2008a) an asset pricing model approach. Our study not just brings a more robust MCSD methodology to the topic but also extends previous studies by comparing performance of ethical funds based on ethical criteria, nature of ethical research employed (internal or internal plus external) and geographic investment universe (funds investing locally versus funds investing globally).

We compared performance within a set of 29 ethical funds. We divide them into subsets according to the aforementioned criteria and compare performance between a set of funds that subscribe to the said criteria and those that don't. We also compare the performance of each set with the market. We could not find any dominance between sets but we did find that funds which invest by employing a comprehensive ethical strategy dominate the market whereas funds which employ only screening as an ethical strategy fail to do so. This could be because a comprehensive ethical strategy allows fund managers to choose from a bigger prospective investment universe whereas an only screening approach limits the set of investment alternatives available to the fund managers.

We also find consistently that funds which invest locally dominate the market while those investing globally do not. Global funds have a bigger investment universe to choose from and thus it seems odd that they come out poorer in comparison to local funds; but since all the 29 ethical funds are UK based, it seems that the fund managers have a "home field advantage" when it comes to picking stocks – perhaps due to better informational access obtained through a closer interaction with the management teams of local firms and greater

experience & expertise with local issues; both of which may lead to a superior analysis of local firms as compared to foreign ones.

The type of ethical research used (internal v/s external) has no bearing on performance.

Thus all risk averse utility maximizing investors would benefit by reducing the proportion of their investment in the market portfolio while increasing the same in ethical funds that employ a comprehensive ethical strategy and/or invest locally. Furthermore, this dominance of the market is net of fees i.e. after incorporating the management fees & operating expenses charged by the said funds.

7.6 Concluding Remarks

In this thesis we study the performance of ethical equity investing in the UK. We look at three key issues: performance of ethical funds versus conventional funds; performance of ethical indices versus conventional indices; and finally, performance of certain ethical criterion versus other such criterion.

Previous studies have looked at these issues but they have used an MV and/or asset pricing model based methodology. Both these approaches suffer from serious drawbacks and hence we choose to employ a more robust MCSD methodology. The latter is a significant contribution of this study.

On the empirical front, our contributions can be stated as follows. We find in contrast with previous studies that on average both ethical & conventional funds

dominate the market; the said outperformance is resilient to the effect of fees. Thus if investors are able to select the right funds (whether ethical or conventional) to invest in they can outperform the market. We also find in contrast with previous studies that the US & global ethical indices are dominated by conventional ones. Thus in those cases passive ethical investors would pay a financial price for being ethical. We believe that the contrast in our findings with those of previous studies arises out of our use of a superior MCSD methodology as compared to the MV and/or model based methods used by them. The former as opposed to the latter incorporates crucial bits of information such as skewness & kurtosis into the evaluation which in reality have a significant impact on performance assessment. And finally, we find that UK ethical funds which employ a comprehensive ethical strategy (subscribe to all ethical criteria) and/or invest locally (only in UK listed firms) outperform the market. Since the global ethical index also performs poorly, it appears that UK ethical investors would be better off investing in funds & indices with a local focus i.e. investing only in UK listed firms.

7.7 Future Research

As the ethical investing movement gathers momentum it is spreading to newer markets like Australia, Canada and Japan; even though at present it's still in its infancy in these countries, going forward it would be interesting to conduct a similar study analysing the performance of ethical equity investing in those markets.

Secondly, inspite of decent previous attempts, finance theory still lacks a robust multi-utility framework which would incorporate non-financial utility while comparing asset performance. It would be interesting to compare performance of ethical funds with conventional ones under such a framework – one that would account for the "ethicalness" of an the investment (ethical utility) alongside the traditional risk & return trade-offs (financial utility).

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